CITY GOVERNMENT.

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COST OF STREET ELECTRIC LIGHTS.

The bureau of information of the League of American Municipalities is now engaged in gathering facts regarding the cost of electric, gas and naptha street lighting. From returns already in, the truth of which are vouched for by the officials of the various cities reported, the accompanying statistical tables on the cost of electric street lighting have been compiled. A total of 107 contracts, representing 105 cities, and twenty-five municipal electric plants are represented in these tables.

The first table shows twenty-nine contracts for 1,200 candle power lights, and it is published merely for the purpose of drawing a comparison between the cost of 1,200 and 2,000 candle power lights. It is shown that the average price, per lamp hour, of 1,200 candle power lights is 2.73 cents, while the average price, per lamp hour, of 2,000 candle power lights is 2.81 cents, a difference of only eight one-hundredths (.08) of a cent.

Passing on to the second table we find statistics on contracts for 2,000 candle power lights from seventy-six cities, situated in all sections of the country. Des Moines, Ia., and Minneapolis, Minn., each present two contracts, one for all night lighting and the other for the shorter schedule. In both of these cities, it will be observed, the cost of lights on the all night schedule is nine-tenths (.9) of a cent per hour, less than that of lights burned but 2,250 hours a year.

For the convenience of those who desire to study comparisons, the seventy-eight contracts have been arranged, according to cost per lamp hour, in six groups. All those showing a cost per lamp hour of less than 1.5 cents are placed in group No. 1, from 1.50 to 2 cents per hour in group No. 2, from 2 to 2.5 cents per hour in group No. 3, from 2.5 to 3 cents per hour in group No. 4, from 3 to 3.5 cents per hour in group No. 5, and over 3.5 cents per hour in group No. 6.

As 2.81 cents is the average price per lamp hour of the seventy-eight contracts, group No. 4 (from 2.5 to 3 cents) is taken as the average group. Now, as to the life of contract, which is said to have some bearing on the price, we find fourteen cities with contracts expired or without time limit, fourteen contracts for one year, three for two years, ten for three years, twenty-four for five years, one for nine years, nine for ten years, one for twenty years and two for twenty-five years. Relating to prices, three of the one-year contracts are in the average group, four below and seven above the average; two of the two-year contracts are in the average group and the other below the average; one of the three-year contracts is in the average group, five below and four above; four of the five-year contracts are in the average group, twelve below and eight above; the nine-year contract is above the average; two of the ten-year contracts are in the average group, two below and five above; the twenty-year contract is above the average; one of the twenty-five-year contracts is in the average group and the other below. Looking at this item in another way, we find 50 per cent. of the one-year contracts, 40 per cent. of the three-year contracts, 33 1-3 per cent. of the five-year contracts, 55 per cent. of the ten-year contracts, and 100 per cent. of the twenty-year contracts above the average price.

These statistics cannot be made to show that the number of lights supplied under each contract has anything to do with making the price. For instance, Providence, with 1,891 lights, pays 3.19 cents per lamp hour, while Newark, with nearly as many lights, pays but 2.45 cents. Baltimore, with 1,369 lights, pays 3.19 cents, while Buffalo, with 2,550 lights, pays only 2.53 cents. Brat-

ARC ELECTRIC STREET LIGHTS—1,200 C. P.—CONTRACT PRICES.

	Life of contract: Years.	No. of lights.	Hours burned per year.	Per lamp per year.	Price per lamp hour: Cents.
Anniston, Ala	2	55	2,250	$75.00	3.33
Amsterdam, N. Y	5	154	3,800	94.50	2.48
Beverly, Mass	5	175	3,800	109.50	2.88
Cambridge, Mass	1	514	3,900	100.00	2.56
Charleston, S. C	—	112	2,179	100.00	4.58
Charleston, W. Va	1	86	2,250	72.00	3.20
Chillicothe, O	10	177	3,800	65.00	1.71
Circleville, O	10	121	2,700	75.00	2.77
Chelsea, Mass	5	200	3,800	104.98	2.76
Dover, N. H	5	130	2,000	67.00	3.35
Elmira, N. Y	5	300	3,800	80.00	2.10
Fort Madison, Ia	—	87	2,250	67.50	3.00
Fitchburg, Mass	3	256	3,800	110.00	2.89
Gloversville, N. Y	5	118	3,800	92.59	2.43
Hartford, Ct	4	715	3,960	75.24	1.90
Holyoke, Mass	—	254	3,800	100.00	2.63
Janesville, Wis	3	156	3,800	65.00	1.73
Kingston, N. Y	3	105	3,800	85.00	2.23
Kearney, Neb	—	11	3,800	106.20	2.79
Lafayette, Ind	5	285	2,200	66.00	3.00
Madison, Wis	5	123	3,263	60.00	1.83
Milford, Mass	2	46	2,365	100.00	4.22
New Haven, Ct	3	412	4,000	91.25	2.28
Newburgh, N. Y	1	274	3,800	96.22	2.53
Newton, Mass	3	288	3,360	100.00	2.97
Norfolk, Va	3	280	3,650	85.00	2.32
New London, Ct	1	151	3,650	100.00	2.73
Savannah, Ga	5	502	3,650	72.00	1.97
Stillwater, Minn	—	16	2,250	96.00	4.26

Total, 29 contracts; average price per, lamp, per hour.....cents 2.73

ARC ELECTRIC STREET LIGHTS.—2,000 C. P.—CONTRACT PRICE.

City	Life of contract—Years.	No. of Lights.	Hours burned per year.	Per lamp per year.	Price Per lamp hour: Cents.
Atlanta, Ga	5	632	3,800	$85.00	2.23
Allentown, Pa	1	142	3,800	100.00	2.63
Asheville, N. C	1	96	3,800	85.00	2.23
Auburn, Me	5	86	3,432	50.00	1.45
Baltimore, Md	5	1,369	4,000	127.75	3.19
Buffalo, N. Y	5	2,550	3,948	100.00	2.53
Butte, Mont	3	133	3,800	144.00	3.78
Belleville, Ill	3	150	2,260	75.00	3.32
Brattleboro, Vt	—	49	2,000	90.00	4.50
Boone, Ia	1	34	3,000	90.00	3.00
Belfast, Me	—	26	1,800	76.65	4.25
Chicago, Ill	1	531	3,800	103.00	2.71
Columbus, Ga	1	120	2,182	85.00	3.89
Denver, Colo	—	950	3,800	100.00	2.63
Des Moines, Ia	—	183	3,800	75.00	1.97
Des Moines, Ia	—	129	2,250	65.00	2.88
Davenport, Ia	25	422	2,200	56.00	2.54
Easton, Pa	1	41	3,800	49.50	1.30
E. St. Louis, Ill	10	144	3,800	100.00	2.63
Fort Wayne, Ind	5	260	2,250	100.00	4.44
Fort Smith, Ark	10	100	2,250	80.00	3.55
Faribault, Minn	5	44	2,000	51.00	2.55
Grand Rapids, Mich	—	409	3,800	90.00	2.36
Galesburg, Ill	1	175	2,250	75.42	3.35
Gainesville, Tex	5	30	3,000	90.00	3.00
Hot Springs, Ark	10	32	3,800	180.00	4.73
Hopkinsville, Ky	—	40	3,800	92.10	2.42
Hutchinson, Kan	10	34	2,500	100.00	4.00
Haverhill, Mass	1	191	3,800	125.00	3.28
Iowa City, Ia	5	100	2,700	72.50	2.68
Joplin, Mo	5	60	3,800	72.00	1.89
Kansas City, Mo	—	190	3,800	110.00	2.89
Kenosha, Wis	10	107	2,250	78.00	3.44
Keokuk, Ia	5	143	2,250	75.00	3.33
Louisville, Ky	5	1,454	3,760	84.00	2.23
Lowell, Mass	5	469	3,650	120.45	3.30
Lockport, N. Y	2	255	3,800	78.00	2.05
Lawrence, Mass	3	222	2,000	90.00	4.50
Lima, O	9	171	2,250	90.00	4.00
Leadville, Colo	—	40	3,800	162.00	4.26
Minneapolis, Minn	1	637	2,250	90.00	4.00
Minneapolis, Minn	1	164	3,500	108.50	3.10
Memphis, Tenn	5	267	3,800	85.00	2.23
Mobile, Ala	5	206	3,800	88.00	2.31
Mankato, Minn	5	55	2,250	74.00	3.28
Menominee, Mich	—	68	2,250	58.82	2.61
Massillon, O	—	125	2,000	65.00	3.25
New Orleans, La	10	1,623	4,000	127.50	3.19
Newark, N. J	—	1,653	4,010	98.55	2.45
Nashville, Tenn	10	382	3,800	85.00	2.23
Natchez, Miss	10	100	3,800	103.00	2.71
Omaha, Neb	5	333	4,000	114.50	2.86
Oswego, N. Y	5	229	3,800	81.00	2.13
Oil City, Pa	10	106	3,650	80.00	2.19
Olean, N. Y	5	65	4,000	85.00	2.12
Owensboro, Ky	3	100	3,800	72.50	1.90
Oskaloosa, Ia	5	25	2,655	96.00	3.61
Providence, R. I	20	1,891	4,000	127.75	3.19
Peoria, Ill	2	456	3,800	98.00	2.57
Parkersburg, W. Va	—	115	4,053	87.50	2.15
Pana, Ill	3	81	3,800	78.00	2.05
Phoenixville, Pa	5	27	3,800	90.00	2.36
Parsons, Kan	3	51	4,276	84.00	1.96
Roanoke, Va	3	140	4,380	76.65	1.75
Richmond, Ind	25	1,0[illegible]	3,900	90.00	2.30
Rutland, Vt	—	125	3,800	91.25	2.40
St. Paul, Minn	1	257	4,000	93.63	2.34
Salt Lake City, U	3	401	3,800	72.00	1.89
Sacramento, Cal	1	330	3,285	123.00	3.74
Spokane, Wash	5	200	3,800	48.00	1.26
San Antonio, Tex	5	150	2,250	90.00	4.00
Schenectady, N. Y	1	203	4,000	103.00	2.57
Salem, Mass	3	180	3,864	130.00	3.36
Sandusky, O	5	165	4,000	87.50	2.18
St. Cloud, Minn	1	41	3,800	75.00	1.97
Somerville, Mass	2	361	3,828	110.00	2.87
Terre Haute, Ind	5	450	3,800	63.95	1.68
Worcester, Mass	3	610	3,900	116.80	2.99

Total, 78 contracts, average price per lamp, per hour.....cents 2.81

GROUP NO. 1.

Below 1.5 cents per lamp hour:

	Life of Contract.	No. of Lights.	Coal per ton.
Auburn, Me	5	86	$4.00
Easton, Pa	1	41	2.85
Spokane, Wash	5	200	1.50

GROUP NO. 2.

Between 1.5 and 2 cents per lamp hour:

	Life of Contract.	No. of Lights.	Coal per ton.
Des Moines, Ia	0	129	$1.00
Joplin, Mo	5	60	1.00
Owensbboro, Ky	3	100	2.25
Parsons, Kan	3	51	2.30
Roanoke, Va	3	140	2.75
Salt Lake, Utah	3	401	3.75
St. Cloud, Minn	1	41	3.25
Terre Haute, Ind	5	450	.75

GROUP NO. 3.

Between 2 and 2.5 cents per lamp hour:

	Life of Contract.	No. of Lights.	Coal per ton.
Atlanta, Ga	5	632	$1.10
Ashville, N. C	1	96	3.00
Des Moines, Ia	0	183	1.00
Grand Rapids, Mich	0	409	2.60
Hopkinsville, Ky	0	40	1.85
Louisville, Ky	5	1454	1.00
Lockport, N. Y	2	255	2.00
Memphis, Tenn	5	267	1.75
Mobile, Ala	5	206	2.70
Newark, N. J	0	1653	1.70
Nashville, Tenn	10	382	2.10
Oswego, N. Y	5	229	3.00
Oil City, Pa	10	106	1.00
Olean, N. Y	5	65	2.25
Parkersburg, W. Va	0	115	1.15
Pana, Iill	3	81	1.00
Phoenixville, Pa	5	27	2.00
Richmond, Ind	25	181	2.10
Rutland, Vt	0	125	4.50
St. Paul, Minn	1	257	3.25
Sandusky, O	5	165	1.65

GROUP NO. 4.

Between 2.5 and 3 cents per lamp hour:

	Life of Contract.	No. of Lights.	Coal per ton.
Allentown, Pa	1	142	$2.60
Buffalo, N. Y	5	2550	2.00
Chicago, Ill	1	531	2.00
Denver, Col	0	950	2.15
Davenport, Ia	25	422	1.35
East St. Louis, Ill	10	144	1.25
Faribault, Minn	5	44	3.00
Iowa City, Ia	5	100	1.00
Kansas City, Mo	0	190	2.00
Menominee, Mich	0	68	3.25
Natchez, Miss	10	100	2.00
Omaha, Neb	5	333	1.90
Peoria, Ill	2	436	1.25
Schenectady, N. Y	1	203	3.00
Somerville, Mass	2	361	4.15
Worcester, Mass	3	610	4.45

GROUP NO. 5.

Between 3 and 3.5 cents per lamp hour:

	Life of Contract.	No. of Lights.	Coal per ton.
Baltimore, Md	5	1369	$3.00
Belleville, Ill	3	150	.65
Boone, Ia	1	34	1.75
Galesburg, Ill	1	175	2.00
Gainesville, Texas	5	30	3.00
Haverhill, Mass	1	191	4.75
Kenosha, Wis	10	107	2.25
Keokuk, Ia	5	143	2.00
Lowell, Mass	5	469	4.25
Minneapolis, Minn	1	164	3.25
Mankato, Minn	5	55	4.00
Massillon, O	0	125	1.50
New Orleans, La	10	1623	3.00
Providence, R. I	20	1891	4.00
Salem, Mass	3	180	4.10

GROUP NO. 6.

Over 3.5 cents per lamp hour:

	Life of Contract.	No. of Lights.	Coal per ton.
Butte, Mont	3	133	$3.75
Brattleboro, Vt	0	49	4.85
Belfast, Me	0	26	4.00
Columbus, Ga	1	120	2.00
Fort Wayne, Ind	5	260	2.00
Fort Smith, Ark	10	100	1.60
Hot Springs, Ark	10	32	2.50
Hutchinson, Kan	10	34	2.50
Lawrence, Mass	3	122	4.00
Lima, O	9	171	1.75
Leadville, Col	0	40	3.50
Minneapolis, Minn	1	637	3.25
Oskaloosa, Ia	5	25	1.00
Sacramento, Cal	1	330	6.00
San Antonio, Texas	5	150	2.50

tleboro, Vt., with 49 lights, pays 4.5 cents, while Easton, Pa., with 41 lights, pays only 1.3 cents. Comparisons like these may be drawn from the table indefinitely. Louisville, Newark, Buffalo, Baltimore, New Orleans and Providence, each of which has 1,000 lights, pay more per lamp hour than their respective neighbors, Owensboro, Easton, Olean, Allentown, Natchez and Worcester, with an average of less than 200 lights each.

The difference in the cost of coal at various points accounts in a way for the disparity in the prices of lights, yet it does not furnish a satisfactory accounting. Lima and Sandusky, neighboring cities, with the price of coal about the same, and with about the same number of lights, pay 4 cents and

MUNICIPAL PLANTS—2,000 C. P. LAMPS.

(Five per cent. for interest and 4 per cent. for depreciation allowed in every case, in calculating cost per lamp.)

City.	No. of lamps.	Hours burned per year.....	Cost per lamp per year.....	Cost per lamp hour—cents.
Allegheny, Pa.....	1,237	3,976	$72.34	1.81
Aurora, Ill.....	206	2,527	64.55	2.55
Bay City, Mich....	209	2,623	53.25	2.03
Batavia, N. Y.....	103	3,407	65.22	1.91
Bloomington, Ill ..	310	2,712	74.33	2.74
Columbus, Ind.....	82	2,200	58.08	2.64
Detroit, Mich.....	1,882	3,786	79.65	2.10
Decatur, Ill.....	156	2,179	48.40	2.22
Dunkirk, N. Y.....	75	2,809	63.33	2.25
Easton, Pa.....	141	3,833	93.75	2.44
Galveston, Tex.....	300	3,000	82.93	2.76
Goshen, Ind.....	125	2,400	48.26	2.01
Kalamazoo, Mich..	200	3,036	83.29	2.74
Little Rock, Ark..	212	2,453	50.28	2.04
Marion, Ind.....	118	2,200	53.95	2.45
Meadville, Pa.....	109	3,500	66.98	1.91
Newark, O.....	226	3,285	48.54	1.47
Paducah, Ky.....	120	4,000	71.09	1.77
Rochelle, Ill.....	40	2,179	55.22	2.53
St. Joseph, Mo.....	369	2,700	63.79	2.35
St. Charles, Mo....	80	2,920	73.13	2.50
Sherman, Tex.....	64	4,015	68.00	1.69
Topeka, Kan.....	264	2,195	57.91	2.63
Titusville, Pa.....	114	4,000	57.94	1.44
Wheeling, W. Va..	450	4,000	67.00	1.67

Total, 25 plants; average cost per lamp, per hour.....2.17 cents

2.18 cents, respectively, per lamp hour for electricity. Belfast and Auburn, Me., furnish another such example, and still others may be picked out from the table. Why should Providence, with coal at $4 and with over 1,600 lights, pay 3.19 cents per lamp hour, while Rutland, Vt., with coal at $4.50 and with only 125 lights, pays but 2.40 cents per lamp hour? These statistics will call forth many such questions as that.

The table showing statistics from twenty-five representative municipal electric plants, none of which does a commercial business, is well worth studying in comparison with the contract lighting figures given in the other tables. It is shown that the cost of 2,000 candle power lamps under municipal ownership in twenty-five cities averages 2.17 cents per lamp per hour.

NEW YORK'S FRANCHISE TAX LAW.

The Ford franchise tax bill, which was reported as passed by the New York legislature in the last issue of City Government, did not receive the signature of the Governor. Instead of signing the original bill, the Governor called a special session of the legislature and submitted to it a new bill for taxing franchises. The new bill was adopted, has been signed by the Governor, and is now a law. It's principal point of difference from the original Ford bill is that it places the assessing power with the state board of tax commissioners instead of with the local assessors. The full text of the new law follows:

An act to amend the tax law in relation to the taxation of public franchises as real property.

The people of the state of New York, represented in Senate and Assembly, do enact as follows:

Section 1. Subdivision 3 of section 2 of the tax law, is hereby amended to read as follows:

Three. The terms "land," "real estate" and "real property," as used in this chapter, include the land itself above and under water, all buildings and other articles and structures, substructures and superstructures erected upon, under or above, or affixed to the same; all wharves and piers, including the value of the right to collect wharfage, cranage or dockage thereon; all bridges, all telegraph lines, wires, poles and appurtenances; all supports and inclosures for electrical conductors and other appurtenances upon, above, and under ground; all surface, underground or elevated railroads, including the value of all franchises, rights or permission to construct, maintain or operate the same in, under, on or through streets, highways or public places; all railroad structures, substructures and super-structures, tracks and the iron thereon; branches, switches and other fixtures permitted or authorized to be made, laid or placed in, upon, above or under any public or private road, street or ground; all mains, pipes, and tanks laid or placed in, upon, above or under any public or private street or place for conducting steam, heat, water, oil, electricity or any property, substance or product capable of transportation or conveyance therein or that is protected thereby, including the value of all franchises, rights, authority or permission to construct, maintain or operate in, under, above, upon or through any streets, highways or public places, any mains, pipes, tanks, conduits or wires, with their appurtenances for conducting water, steam, heat, light, power, gas, oil or other substance, or electricity for telegraphic, telephonic or other purposes; all trees and underwood growing upon lands, and all mines, minerals, quarries and fossils in and under the same, except mines belonging to the state. A franchise, right, authority or permission, specified in this subdivision, shall for the purpose of taxation be known as a special franchise. A "special franchise" shall be deemed to include the value of the tangible property of a person, co-partnership, association or corporation situated in, upon, under or above any street, highway, public place or public waters in connection with the special franchise. The tangible property so included shall be taxed as a part of the special franchise. No property of a municipal corporation shall be subject to a special franchise tax.

Section 2. Article 2 of the tax law is hereby amended by adding at the end thereof sections 42, 43, 44, 45, 46 and 47 to read as follows:

Section 42. Assessment of special franchise.

The state board of tax commissioners shall annually fix and determine the valuation of each special franchise subject to assessment in each city, town, village or tax district. Such board shall, not less than ten nor more than thirty days next preceding the date when the annual assessment is required by law to be completed in any such city, town or village, file with the clerk of such city, town or village, a written statement of the valuation of each special franchise in such city, town, village or tax district as fixed and determined by such board; and the valuations so fixed, shall be the assessed valuation on which all taxes based on such special franchise in such city, town or village for state, municipal, school or highway purposes, shall be levied during the next ensuing year. The assessors or other taxing officer or other local officer in any city or town or village, or any state or county officer, shall on demand furnish to the state board of tax commissioners any information required by such board for the purpose of determining the value of a special franchise. Each city, town or village clerk shall within five days after the receipt by him of a statement of assessment of a special franchise by the state board of tax commissioners, deliver a copy of such statement certified by him to the assessors or other officers charged with the duty of making local assessments, in each tax district in such city, town or village. The valuation of a special franchise also fixed by the state board of tax commissioners shall be entered by the assessor or other officers in the proper column of the assessment roll.

Section 43. Report to the state board of tax commissioners.

Every person, co-partnership, association or corporation subject to taxation on a special franchise shall, within thirty days after this section takes effect, or within thirty days after such special franchise is acquired, make a written report to the state board of tax commissioners, containing a full description of every special franchise possessed or enjoyed by such person, co-partnership, association or corporation, a copy of the special law, grant, ordinance or contract under which the same is held, or if possessed or enjoyed under a general law, a reference to such law, a statement of any condition, obligation or burden imposed upon such special franchise, or under which the same is enjoyed, together with any other information relating to the value of such special franchise, required by the state board. The state board of tax commissioners may, from time to time, require a further or supplemental report from any such person, co-partnership, association or corporation, containing information and data upon such matters as it may specify. Every report required by this section shall have annexed thereto the affidavit of the president, vice president, secretary or treasurer of the association or corporation, or one of the persons or one of the members of the co-partnership making the same, to the effect that the statements contained therein are true. Such board may prepare blanks to be used in making the reports required by this section. Every person, co-partnership, association or corporation failing to make the report required by this section, or failing to grant any special request by the state board of tax commissioners within a reasonable time speci-

fied by it, shall forfeit to the people of the state the sum of $100 for every such failure and the additional sum of $10 for each day that such failure continues, and shall not be entitled to review the assessment by certiorari, as provided by section 45 of this chapter.

Section 44. Hearing on special franchise assessments:

On making an assessment of a special franchise, the state board of tax commissioners shall immediately give notice in writing to the person, co-partnership, association or corporation affected, stating in substance that such assessment has been made, the total valuation of such special franchise and the valuation thereof in each city, town, village or tax district; and that the board will meet at its office in the city of Albany on a day specified in such notice, which must not be less than twenty nor more than thirty days from the date of notice, to hear and determine any complaint concerning such assessment. Such notice must be served at least ten days before the day fixed for the hearing; and it may be served on a co-partnership, association or corporation, by mailing a copy thereof to it of its principal office or place of business and on a person, personally, or mailing it to him at his place of business or last known place of residence. Section 36 of this chapter applies so far as practicable to a hearing by the state board of tax commissioners under this section.

Section 45. Certiorari to review assessment:

An assessment of a special franchise by the state board of tax commissioners may be reviewed in the manner prescribed by article 11 of this chapter, and that article applies so far as practicable to such an assessment, in the same manner and with the same force and effect as if the assessment had been made by local assessors; except that a petition for a writ of certiorari to review the assessment must be presented within fifteen days after notice of the filing of the statement of the valuation of a special franchise with the clerk of the city, town or village, as prescribed by section 42 of this chapter. Such writ must run to and be answered by said state board of tax commissioners and no writ of certiorari to review any assessment of a special franchise shall run to any other board or officer unless otherwise directed by the court or judge granting the writ. An adjudication made in the proceeding instituted by such writ of certiorari shall be binding upon the local assessors and any ministerial officer who performs any duty in the collection of said assessment in the same manner as though said local assessors or officers had been parties to the proceedings. The state board of tax commissioners, on filing with the city, town or village clerk a statement of the valuation of a special franchise, shall give to the person, co-partnership, association or corporation affected, written notice that such statement has been filed, and such notice may be served on a co-partnership, association or corporation by mailing a copy thereof to it at its principal office or place of business and on a person either personally or by mailing it to him at his place of business or last known place of residence.

Section 46. Deduction of the special franchise tax for local purposes:

If, when the tax assessed on any special franchise is due and payable under the provisions of law applicable to the city, town or village in which the tangible property is located, it shall appear that the person, co-partnership, association or corporation affected has paid to such city, town or village for its exclusive use within the next preceding year, under any agreement therefor, or under any statute requiring the same, any sum based upon a percentage of gross earnings, or any other income, or license fee, or any sum of money on account of such special franchise, granted to or possessed by any such person, co-partnership, association or corporation, amounts so paid for the exclusive use of such city, town or village except money paid or expended, for paving or repairing of pavement of any street, highway or public place, shall be deducted from any tax based on assessment made by the state board of tax commissioners for city, town or village purposes, but not otherwise; and the remainder shall be the tax on such special franchise payable for city, town or village purposes. The chamberlain or treasurer of a city, the treasurer of a village, the supervisor of a town, or other officer to whom any sum is paid for which a person, co-partnership, association or corporation is entitled to credit as provided in this section, shall, not less than five nor more than twenty days before a tax on a special franchise is payable, make and deliver to the collector or receiver of taxes or other officer authorized to receive taxes for such city, town or village, his certificate showing the several amounts which have been paid during the year ending on the day of the date of the certificate. On the receipt of such certificate the collector, receiver or other officer shall immediately credit on the tax roll to the person, co-partnership, association or corporation affected, the amount stated in such certificate, or any tax levied against such person, co-partnership, association or corporation on any assessment of a special franchise for city, town or village purposes only, but no credit shall be given on account of such payment or certificate in any other year, nor for a greater sum than the amount of the special franchise tax for city, town or village purposes for the current year, and he shall collect and receive the balance, if any, of such tax as required by law.

Section 47. Special franchise not to affect other tax.

The imposition or payment of a special franchise tax as provided in this chapter shall not relieve any association, co-partnership or corporation from the payment of any organization tax or franchise tax on any other tax otherwise imposed by article 9 of this chapter, or by any other provision of law, but tangible property subject to a special franchise tax situated in, upon, under or above any street, nighway, public place or public waters, as described in subdivision 3 of section 2 shall not be taxable except upon the assessment made as herein provided by the state board of tax commissioners.

Section 3. Sections 21 and 31 of the tax law are hereby amended to read as follows:

Section 21. Preparation of assessment roll.

They shall prepare an assessment roll containing six separate columns and shall, according to the best information in their power, set down:

1. In the first column the names of all the taxable persons in the tax district.

2. In the second column, the quantity of real property taxable to each person with a statement thereof in such form as the commissioners of taxes shall prescribe.

3. In the third column the full value of such real property.

4. In the fourth column the full value of all the taxable personal property owned by each person respectively after deducting the just debts owing by him.

5. In the fifth column the value of taxable rents reserved and chargeable upon lands within the tax district estimated at a principal sum, the interest of which, at the legal rate per annum, shall produce a sum equal to such annual rents and if payable in any other thing except money the value of the rents in money to be ascertained by them and the value of each rent assessed separately and if the name of the person entitled to receive the rent assessed cannot be ascertained by the assessors, it shall be assessed against the tenant in possession of the real property upon which the rent were chargeable.

6. In the sixth column the value of the special franchise as fixed by the state board of tax commissioners.

Section 31. Corporations now assessed.

The assessors shall assess corporations liable to taxation in their respective tax districts upon their assessment roll in the following manner:

1. In the first column the name of each corporation and under its name the amount of its capital stock paid in and secured to be paid in; the amount paid by it for real property then owned by it wherever situated; the amount of all surplus profits or reserve funds exceeding 10 per centum of their capital, after deducting therefrom the amount of said real property and the amount of its stock, if any, belonging to the state and to incorporated literary and charitable institutions.

2. In the second column the quantity of real property except special franchises owned by such corporations and situated within their tax district.

3. In the third column the actual value of such real property, except special franchises.

4. In the fourth column the amount of the capital stock paid in and secured to be paid in, and of all of such surplus profits or reserve funds as aforesaid, after deducting the sums paid out for all the real estate of the company, wherever the same may be situated and then belonging to it, and the amount of stock, if any, belonging to the people of the state and to incorporated literary and charitable institutions.

5. In the fifth column the value of any special franchise owned by it as fixed by the state board of tax commissioners.

Section 4. subdivision 6 of section 171 of the tax law is hereby amended to read as follows:

6. Employ a clerk, prescribe his duties and fix his salary at a sum not exceeding two thousand dollars, and also other needed assistants, prescribe their duties and fix their compensation which shall not exceed in the aggregate the amount annually appropriated by the legislature for that purpose.

Section 37 of the tax law is hereby amended to read as follows:

Section 37. When the assessors, or a majority of them, shall have completed their roll, they shall severally appear before any officer in their county authorized by law to administer oaths and shall severally make and subscribe before such an officer an oath in the following form: "We, the undersigned, do severally depose and swear that we have set down in the foregoing assessment roll all the real estate situated in the tax district in which we are assessors, according to our best information; and that,

with the exception of those cases in which the value of the said real estate has been changed by reason of proof produced before us, and with the exception of those cases in which the value of any special franchise has been fixed by the state board of tax commissioners, we have estimated the value of said real estate at the sum which a majority of the assessors have decided to be the full value thereof; and, also, that the said assessment roll contains a true statement of the aggregate amount of the taxable personal estate of each and every person named in such roll over and above the amounts of debts from such persons, respectiveiy, and excluding such stocks as are otherwise taxable, and such other property as is exempt by law from taxation, at the full value thereof, according to our best judgment and belief:" which oath shall be written or printed on said roll, signed by the assessors and certified by the officer.

Section 5. This act shall take effect on the first day of October, one thousand eight hundred and ninety-nine.

MUNICIPAL PLANTS IN GREAT BRITAIN.

A review of the electrical schemes which are being undertaken at the present moment by municipalities reveals some distinctly interesting features. For the most part the schemes are well advanced, and during the next few months we shall witness the completion of a considerable number of lighting and tramway systems. In considering these systems, one cannot fail to be struck by the fact that municipalities, as a rule, are not showing themselves slow in adopting the many minor improvements that have been effected in electrical appliances during the past two or three years, and an equally strong feature is the resolve of local authorities to embark at the outset upon larger schemes than was the case some few years ago, when electric lighting had not demonstrated its commercial soundness to the satisfaction of municipal bodies. In no instance is this better shown than in the case of Edinburgh, where the success which has attended the lighting works has been phenomenal. So great has been the growth of electric lighting in Edinburgh that since May 15th last year no fewer than 70,500 8 candle power lamps have been added to the system. At this rate of growth the demand for new plant during the next few months will be very considerable. Bailie Mackenzie, the convener of the Electric Lighting Committee, stated that in the coming year the electricity works would have an output for private lighting of the enormous extent of 4,500,000 units, and, with 1,200,000 units for public lighting, they would have next year the extraordinary output of 5,700,000 units of electrical energy. It was expected that they would have a surplus of £14,000 next year. At Brighton an almost similar state of things prevails, and the Lighting Committee have recently presented a report recommending the borrowing of £64,000 for the purposes of the electricity undertaking for 1899 and 1900. The engineer, Mr. Arthur Wright, is of the opinion that during the current year £26,350 extra capital would be required, and that the needs for 1900 would amount to £37,650. We have mentioned these two cases, because it can be claimed, without hesitation, that the success achieved, both at Edinburgh and Brighton, has been due almost entirely to the fact that the corporations of the two towns have recognized the great importance of supplying electricity at low rates. It has been pointed out more than once in our columns that electric lighting will provide an adequate return, so long as the price is sufficiently low and the short hour consumer is understood.

The Manchester Corporation is about to begin the erection of new works, which will be, when completed, among the first two or three of the largest electric lighting undertakings in the whole world. Although the scheme is ambitious enough, and has for its object the lighting of a vast area outside the city of Manchester proper, and is also designed to supply electrical energy for a very large and comprehensive system of tramways, it cannot be said that the details of the system have not been designed with the highest skill and will not be in accordance with the best modern practice with regard to mechanical and electrical details. The size of plant will be the largest ever employed in this country, and at the outset will probably comprise 8 units, each having an output of 5,000 horse power. Although the output of these machines is in some respects phenomenal, it must be remembered that Manchester is already experiencing the advantages of using exceptionally large plant, for there is now running in the present electric lighting station an engine and dynamo which is capable of developing 3,000 horse power. The designing of the new system has for its object the generation of electricity away from the centre of the town, and the distribution from sub-stations arranged in various positions in the area of supply. The working results will be watched with the closest interest, because the system constitutes quite a revolution in the supply of electrical energy; and it is a very gratifying feature to find a municipality among the first to enter upon so great a scheme.

In the neighboring town of Liverpool, which is in many respects a close rival of Manchester, there is a great development of electric tramways taking place. No sooner was the experimental line completed than the corporation resolved upon a more extensive system, which will connect the centre of Liverpool with the different outlying suburbs. Already there are on order eignty electric cars, and it may be confidently expected that these will be shortly completed. For the generating plant the corporation has given an order to Messrs. Willans & Robinson for eight engines, each of which will develop 1,200 horse power as a continuous load and 1,500 horse power as emergency load. We may remind our readers that the overhead wire system is to be adopted throughout Liverpool, and it is especially satisfactory to see that system adopted, because, as an authority pointed out the other day, if any new and more efficient system of electric tramways is evolved during the next few years the overhead wire system will be the easiest of all systems to convert. During the next few months a very large system of electric tramways will be completed in Sheffield, where, it will be remembered, the corporation some time ago bought up the local tramway system, and immediately the purchase was completed began a reconstruction of the system for electric working. Almost a similar state of things prevails at Hull, where the town tramways are being rapidly converted for electrical working. The combined lighting and tramway scheme at Plymouth is approaching completion, and will, doubtless, be in operation during the next few weeks. Nottingham is following rapidly in a similar direction; Portsmouth will during the next few days begin the equipment of the tramway system; and Sunderland, Newcastle, Bolton, Bath, Hastings and Brighton have decided to adopt electric tramways, in some of these cases schemes being already in progress.—The Surveyor, London.

PARK ASSOCIATION MEETS THIS MONTH.

The American Park and Outdoor Art Association will hold its annual convention at Detroit, Mich., June 27-28-29. The headquarters of the association will be at the Hotel Cadillac, where every convenience for the transaction of the convention business will be provided. Local committees at Detroit have arranged to give the delegates trolley rides through the city to the various parks, and the afternoon of the 28th will be devoted to a steamboat excursion up Lake St. Clair, stopping for a short time at one of the attractive club houses in the renowned "Venice of America."

The program for the convention includes an address by the president of the association, Hon. Charles M. Loring, of Minneapolis, and the following papers: "Park Designs," by P. L. Olmsted, Jr.; "Finger Boards and View Points," by Charles W. Garfield; "Utilization of Vacant City Lots for the Poor," by John McGregor; "Boston Common," by E. J. Parker; "Park Nomenclature and Accounts," by G. A. Parker; "Park Landscapes," by George R. King; "Surveys," by Gordon H. Taylor; "Outdoor Art in School and College Grounds," by J. W. Beal.

IMPROVEMENTS AT AUBURN.

The city of Auburn has taken on a new lease of life. A great deal of construction is under way and still greater demands are made for house room. This spirit of growth now amounts to a contagion and the city government is inspirited thereby to a large degree, so that improvements in several directions are in the air. Among those which are talked about and contemplated as necessities to meet present conditions are a new city hall, enlarged police and fire quarters, patrol signal service, starting of a police pension fund, and five miles of water pipe.

WATER DEPARTMENTS.

Practical Value of Bacteriological Examinations of Water.

BYA. M. BLEILE, OHIO STATE UNIVERSITY.

Not much over a decade ago the only means for judging of the sanitary position of a water was by the results of a chemical examination. Yet notwithstanding the enormous labor and ingenuity bestowed on the working out of these chemical methods, and notwithstanding the wonderful accuracy of their results, they could only tell us, when taken by themselves, that a water might or might not be safe in its use as a potable water. A definite, precise and certain answer could not be given, only an inference more or less likely to be true, could be drawn. When it was firmly established that certain diseases were due to certain bacteria, it was thought that we would have in the bacteriological examination a sure, quick and inexpensive way (and these points are all necessary in practical work) for determining the fitness of water for drinking purposes. This desideratum has unfortunately here too escaped us, but it may not be amiss to fix briefly what the value of a bacteriological examination, which can be carried out rapidly and economically, is.

The germs of two diseases, typhoid fever and cholera, are so generally recognized as being water born that frequently they are looked upon as being the only ones, and with us in fact usually typhoid as the only one so carried, and the only disease threatening us in impure water. But it is well to remember that other and numerically greater dangers may lurk in polluted water, and while it must be said that the search after typhoid and cholera bacteria direct in drinking water has only been successful in rare and isolated cases, even when water has been known to contain them, still, recognition of the danger of large numbers of bacteria in general gives to the bacteriological examination of water a great value. Polluted waters which would show a high bacterial content may carry and produce infection with pin worms or tape worms. The spores of the lock jaw and the anthrax bacilli have been found in such waters and the many miscellaneous bacterio of filthy water may produce blood poisoning when such filthy water is used in the washing of small wounds, as so often happens. It is further recognized that grave diarrhoes and that so frequently fatal from cholera infantum, may also be produced by such waters. Not only by its direct use, but indirectly when it is used for the washing of vegetables eaten in the raw states or the rinsing of vessels later used for keeping milk. Here the bacteria remaining in the small quantities of water left behind find in the vegetables or in the milk conditions suitable for their growth and are therefore introduced in enormous numbers when these substances are later eaten.

As you know, the only thing feasible in many cases is to determine the number of bacteria in a given sample of water, and this can be completed in a few days. Even in this simple precedure it must be confessed that the methods are not perfect, as no medium has yet been found which offers equally favorable conditions for the growth of all kinds of bacteria. Nor can usually any provision be made for those bacteria that will only grow in the absence of air. But fortunately the error here is not a great one and for comparative results, which many of these examinations are, it can be safely neglected. By such simple means then a very close approximation as to the general amount of pollution may be made. It may be shown that purification of a stream has or has not taken place.

Periodic examinations of a water supply will promptly reveal a rise in the number of bacteria, the introduction of an unusual pollution or give guarantee of the efficiency of the safe-guards taken, and we have here the only practical means for testing and controlling the working of a filter plant. It being established then that a mere numerical determination of bacteria is not in all cases satisfactory, the proposal was made to consider the number of kinds of species of bacteria found rather than the total number. This proposal is indeed a valuable one, for if a water contains disease producing bacteria, the pollution that has brought these will have, generally speaking, also brought a larger variety of other bacteria, and hence the justification of the suggestion.

Further, the more numerous the sources of pollution are, the greater will probably be the number of different kinds of bacteria to be found, as each fresh source of pollution will almost certainly introduce one or more new kinds. This means that a water showing many varieties will have been exposed very frequently to the liability of taking up germs capable of causing disease. To carry out this method to its fullest possibilities, the exact nature of each kind ought to be determined, but in most cases this cannot be done on account of the requirements of time and money necessary but seldom available in such work.

Instead then of determining all species present, bacteriologists are usually satisfied to determine the presence or absence of fecal bacteria, bacteria always found in the excrement of man or animals, for at present there is no way of saying whether these so called fecal bacteria are from human or from animal excrement. The colon bacillus is the one usually singled out in this search, since the methods for its discovery are reasonably exact and expeditious, though we are coming to recognize that there are several species rather than a single one which should come under this head. The viciousness of a find of colon bacilli is apparent when we make in this connection the very logical argument that if the more or less inoccuous colon bacillus, indicating human excrement, finds its way constantly into the water under consideration, the typhoid bacillus which is also carried in the feces may at any time invade the water. This reasoning would of course not hold where these fecal or intestinal bacteria are known to come not from human but from animal waste as for example from the rain washings of a manured field.

In this connection, the consideration of the mere numbers as against the number of kinds, I may quote from Migula, who, pointing out that the number of bacteria will depend not only on the degree or kind of pollution, but also upon a variety of external conditions as temperature, variation, light, etc., says: "The number of individuals is merely a result of growth or multiplication influenced by such conditions; the number of different species a result of the kinds and frequency of pollution."

It is sometimes urged that water in practice is never free from bacteria and that even a large number of germs found therein may not render a water unfit for use since they may all be harmless varieties. And in further support of this view the statement is made that many fluids in common use, as milk, ordinarily contain bacteria far in excess of the number found in water. True, milk as it reaches the consumer, even when gathered under the most approved conditions, contains never less than five thousand bacteria per cc and may contain from ten thousand to one hundred thousand and even over. But they are few in kinds, are mainly the air born, harmless, often beneficial bacteria, and are found in such large numbers simply because the milk furnishes for them a good breeding ground. A large number of bacteria in water is to be regarded in quite a different light. Pure water originally contains none, or at most, few bacteria, and pure water is not, as is milk, a suitable medium for their growth and hence a large number, even irrespective of varieties, always indicates a pollution which is certainly suspicous and in most cases on account of the presence of putrefactive bacteria, positively dangerous.

How many bacteria then may water contain before it may be considered unfit from a sanitary standpoint? Curiously enough there is no concordance of opinion on this point, and the upper limit is placed by different writers at anywhere from fifty to one thousand per cc. The latter limit in my opinion is decidedly too high. The true limit must be determined in each case by the judgment of the bacteriologist after analysis of the local conditions—a judgment which will consider the facts also given by the chemist and the engineer.

One drawback encountered by the bacteriologist lies in the fact that water examinations must be made immediately the sample is taken, that is, on the spot, and not after a transport lasting days or even several hours. Shipping in ice, more or less heartily recommended by some writers, is never permissible for numerical and rarely for species work, for experiments just finished at the university have shown that in so short a time as four hours, after careful packing in ice, will give results utterly at variance with those of an examination made promptly.

These criticisms so freely made on bacteriological methods are not offered as in any sense derogatory of the

methods. On the contrary, it is apparent that we have here means as expeditious, economical and safe as any others now at our command for the determination of the sanitary quality of water. In fact, Dr. Hurty stated to this convention at Indianapolis that in one of his cases fecal bacteria were discovered in a water several days before the chemical examination showed any evidence of the new pollution. For gauging the work of filters and coagulants we have in bacteriology the best, only, method; though here I wish to repeat a protest already made against expressing the results of bacteria removed in per cents rather than in the actual number remaining in the water. For to say that 98 per cent. of one million originally contained have been removed means one thing, whereas 98 per cent. of one hundred means quite another thing; the first case of apparently equal efficiency with the last, giving us a water still containing twenty thousand germs per cc.; the latter containing two per cc.

For the solution of general questions the bacteriological work must be in conjunction with and is indispensable to the chemical and the engineering side of sanitary water.

Duty of the State in Protecting Sources of Public Water Supplies.

BY C. O. PROBST, SECRETARY OHIO STATE BOARD OF HEALTH.

Much has been said for and against paternal government. Too much assistance may be bad for the individual, whose growth in every direction is proportionate to his own exertions.

Is this equally true of a municipality or a group of individuals?

A valued friend, now dead, of wide experience as an executive state health officer, once said the function of the state, as regards health matters, is to teach communities how to live; to point out their sanitary omissions and the remedies. It should be their business to apply them, and if they don't they ought to suffer, for by suffering they learn to conform to the inexorable laws of nature. In speaking of the vast sums of money sent South to relieve yellow fever sufferers, he said his observation taught him that such aid did far more harm than good—harm far reaching and lasting through many generations.

There is a germ of truth in the proposition of my old friend. The state should not undertake to do anything for the individual that he can do equally well himself; and this should hold good for the municipality.

How far can the municipality protect itself against pollution of its water supply?

A city having for its only available source of supply a stream receiving sewage from a city a few miles above, may protect itself by filtering its water supply, or be protected by having the city above purify its sewage. Which should be done, and who should bear the expense if sewage purification is demanded? If methods of water purification have reached a stage where it is safe at all times for a city to make use of a stream containing much sewage, it would be unfair to ask the city above to purify its sewage for the protection of the city below.

Altona is often spoken of as an example of what may be done in converting a very filthy stream into pure water. But while her filters very largely protected her against Hamburg's cholera we will remember that a frozen filter bed was apparently responsible for a slight outbreak of the disease.

Considering the many causes which may interrupt the safe working of filter beds or other form of water purification, there is danger, I fear, that the more ardent advocates of water purification may underestimate the importance of having a fairly clean water to start with. From observation I know there is danger, especially for small cities, that in that form of purification requiring an expensive coagulent the coagulent will be greatly reduced or omitted when the raw water is of good appearance; which may be the time of greatest need of purification. While advocating water filtration, and believing it to be essential for many if not most of the surface waters of this country, we should, in my judgment, make every effort to reclaim and keep free from dangerous pollutions, streams and lakes which are or may become sources of public water supplies.

Turning to the results of sewage purification, are these sufficiently assured to warrant a city in using a stream for water supply purposes, unless filtered, which receives a few miles above the effluent of some sewage disposal works? We have all had proffered to us the sparkling cup of treated sewage at Framingham, Brockton, and other places. Some of us have had faith enough to drink it. But for such ideal results ideal conditions for sewage purification must exist, and they are found only in the minority of cases.

Aside from sewage, streams in thickly settled counties receive various contaminations rendering them unfit and unsafe for water supplies if used in a raw state.

There would seem to be no escape from the conclusion that in most instances municipalities making use of streams for water supply must purify it; and further, that their full measure of safety can only be reached by properly purifying all sewage going into such stream above them. The greatest protection comes from water purification, and this is within the power of the municipality. The guarding of the stream against sewage pollution is a matter for state control. But even the state, meaning by this the larger divisions of territory in this country, may be powerless to protect its municipalities against polluted water supplies if obtained from an interstate or international stream or lake.

One of the gravest questions in Ohio as regards water supplies is that of protecting our cities on the banks of the Ohio river. The conjoint action of several states is required in this case. This would seem to be a proper question for our National Government, but I fear we can look for little protection from this source as, to our disgrace be it said, our National Government continues to ignore all appeals for assistance in sanitary matters.

Viewing the frightful slaughter from typhoid fever now going on in Philadelphia, and considering the causes that have prevented that city from having pure water, one may well ask—Should there not be state interference in cases such as this?

But limiting state control to keeping sources of water supply as free from pollution as possible—how shall this be accomplished? The police powers of the state are doubtless broad enough to prohibit putting any sewage into streams which are or may be used for water supplies, unless it is purified in a satisfactory manner. Such an act, presumably, could be retroactive, in so far as requiring cities already polluting such streams by sewage to care for it in a proper manner, within a reasonable time. But before such a law can be enacted and enforced a systematic education of the public, for a considerable period of time, must precede. This is what is being attempted in Ohio.

In 1893 an act of the Ohio Legislature provided that "no city, village, corporation or person shall introduce a public water supply or system of sewerage, or change or extend any public water supply or outlet of any system of sewerage now in use, unless the proposed source of such water supply or outlet for such sewerage system shall have been submitted to and received the approval of the state board of health."

Since that time the board has been called upon to approve plans for water works, sewerage or sewage disposal for 142 municipalities or public institutions. Where there was evident and imminent danger of water pollution, the plans were disapproved and the turning of crude sewage into streams prevented.

Sewage purification has been encouraged in all possible ways. We now have in Ohio, in operation or being built, thirteen sewage disposal plants.

A word of warning should be given here, and that is that sewage disposal works should be carefully planned and constructed to meet the needs of the locality they have to serve. Two or three costly failures in a state in attempts at sewage disposal are very likely to greatly retard sanitary progress in that direction.

In 1897 the board began a systematic investigation of the condition of Ohio streams, Mr. Allen Hazen having had charge of the inaugural work.

A very good drainage map of the state was made, using as a basis an excellent map constructed by Captain Hiram Chittenden in connection with a Government survey of Ohio for canal purposes. Five of our principal streams have been examined, and the sixth is now receiving attention.

This investigation has included a careful inspection of each watershed by an engineer. He has endeavored to locate the principal sources of pollution, making a map of all towns upon the watershed, showing location of all sewers, and their relation to water works intakes, and, as far as possible, giving the number of house connections for each sewer. Other sources of contamination are noted. Co-operating with the United States geological survey, stations for stream measurements have been established with daily observations, meter readings being made from time to time. From these measurements, in connection with rainfalls, Mr. Newell, chief hydrographer of the United States geological survey, will compute stream flows.

Stations for collecting samples of water for chemical and bacteriological examinations have been established above and below each town on the watershed taking water from or contributing sewage to the stream. These examinations are made monthly.

An effort has been made to have this work popular and educational. A special preliminary report, published last year, which forms the basis for future work, has been placed in the hands of water works officials and engineers of all towns

located upon streams which have been or are being investigated. The interest of the public press has been enlisted; and as far as possible, that of all sanitary authorities, whose attention has been called to especially dangerous sources of water contamination. Already, as a result of this work, several of our municipalities are seeking improvements of their water supply.

In 1898 the legislature authorized the board to establish a laboratory, in which chemical and bacteriological examinations are being made. The same act provided that the board should report annually upon the condition of all public water supplies. Preparatory for this additional work an engineer has been sent to each city or village in Ohio having a public water supply of surface origin. He has prepared a report, to be published this year, upon the condition of the water works in these places, giving source and character of supply, sources of pollution within ten miles of intake, and recording contracts, in the case of private companies, as to the character of the water they had agreed to furnish.

The ten mile limit of pollution was taken because of a law in this state which reads: "The jurisdiction of any corporation owning water works, to prevent or punish any pollution of the water, shall extend ten miles beyond the corporation limits."

Cost of construction, water rates, number of consumers, and other items of interest were noted.

Unfortunately Ohio is weak in the matter of registration of vital statistics, but our next work will be, using municipal statistics, which are fairly accurate, to show the effect upon communities, of using water proven to be polluted.

The object of the various lines of work, thus hastily sketched, is two-fold: First to create a lively public interest in the question of stream pollution and its relation to preventable diseases, and second, to bring before the legislature a final report showing the present condition of our streams, their future, based on probable increased pollution, with recommendations for such legislative enactments as the facts set forth and the backing of public opinion shall warrant.

This Mayor Wants Meters.

Mayor Myers, of Savannah, Ga., announces that the use of water meters will be the next reform he will put before the people of his city in carrying out his policy of retrenchment. He says:

"I will stake my reputation on the assertion that meters will bring about an immense saving to every property owner in Savannah. Where the people of this city pay from $15 to $25 a year for open hydrants, the people of Atlanta get the same service by using meters at from $7 to $12.50. There is every reason to believe that the inordinate demand for water is not due to actual necessity, but is the result of careless habits the people have formed. The daily consumption of water in Savannah amounts to 7,000,000 gallons, while it is but 5,000,000 gallons in Atlanta. I do not propose to consider whether the introduction of meters would be popular or unpopular with the people. If the council will stand by me, they will be put in. There is an element in this city strictly averse to departing from old customs, no difference what the inducement may be, or what the city is to gain in the end. Enough attention is not given to the fact that Savannah is a growing city, that the rapid increase of her population calls for modern municipal methods in the management of all departments, and I fully realize that the lack of metropolitan push on the part of some of our better citizens will have to be overcome."

All Free Services Metered.

The report of the water and electric committee of Marshalltown, Ia., for the year ending March 1, 1899, shows that the committee have wisely metered all free services. In this way it is ascertained that of a total annual pumpage of 421,544,094 gallons, 49,270,500 gallons have been furnished without charge to school buildings, the fire service, the sewer department, etc. The total receipts for the year amounted to $12,747.45 while the expenses were $10,068.99, including $1,247.19 for extension of water mains. During the year 1,374 feet of new mains were laid, making a total of 121,777 feet, with 1,694 services connected. The report says:

Probably no better illustration is afforded of the value of water meters on large consumers than the experience we have had during the past several years. For some time the state paid at the rate of $60 per month, or $720 per year, for water. Late in 1897 a 6-inch meter was purchased and set at an expense of $420.25, and a meter rate of five cents per thousand gallons established. Since the meter was connected the state has paid for fourteen months' water aggregating $1,309.82, against $840 which it would have paid at the old flat rate, or a gain to the water works department of $469.82. It is plain that in the course of a little more than one year the meter which cost over $400 has paid for itself, and insuring a fairer revenue to the city hereafter, to say nothing of the water which is saved.

The plant is now furnishing 109 arc lamps for street lighting, and the expense of operating the electrical machinery is included in the general expense as named above.

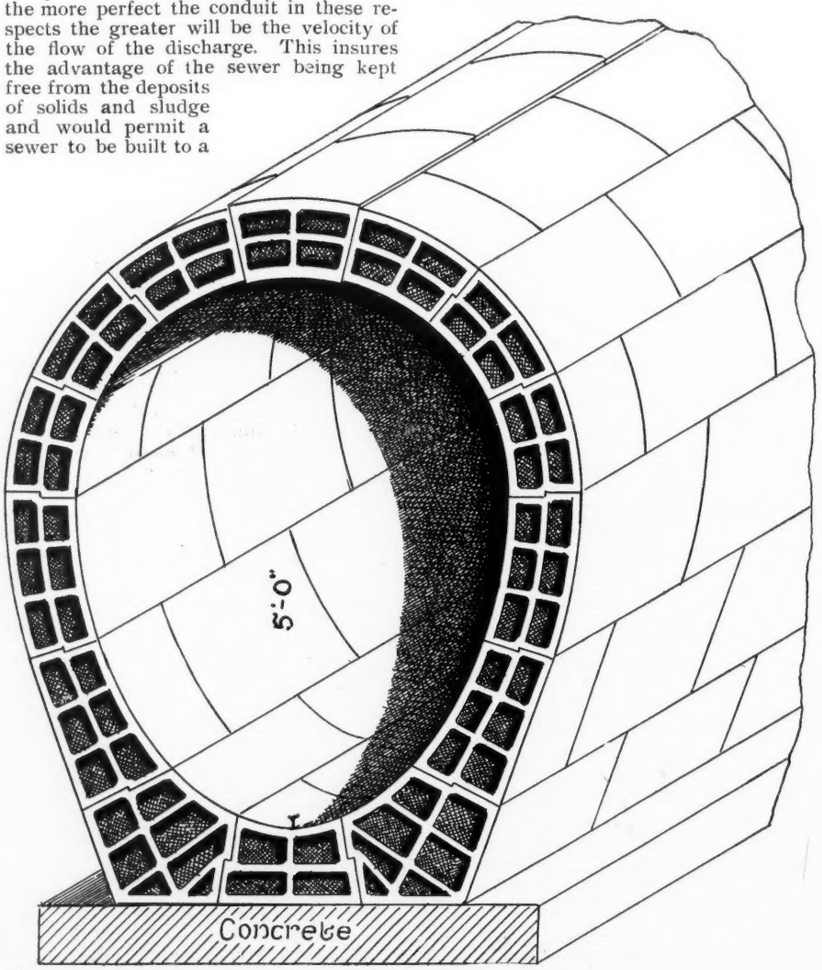
AN IDEAL SEWER.

Patents have been obtained by the National Web Tile Sewer Co., of Syracuse, N. Y., for the manufacture of vitrified tile to be used to construct sewers. William R. Hill, M. Am. Soc. C. E., writes as follows:

"A sewer constructed of this material will possess strength and durability equal to one built of cut stone, and will have a most efficient capacity to discharge the sewage for the following reasons: It can be built to a most perfect line and grade, and would have fewer joints, consequently it would have a smooth interior surface. In hydraulics it is an established fact that the more perfect the conduit in these respects the greater will be the velocity of the flow of the discharge. This insures the advantage of the sewer being kept free from the deposits of solids and sludge and would permit a sewer to be built to a lighter grade. This would be very favorable particularly in a low or flat city or village where but little fall could be obtained.

"A proposal to build a sewer 4 ft. 4 in. wide by 6 ft. 6 in. high of this material has been accepted and approved by the mayor and common council of the City of Syracuse. At this letting proposals were also submitted for the sewer to be built of brick. The proposal for a tile sewer complete (including trenching, backfilling and repaving) was the lowest by about 10 per cent.

"In my opinion the ideal sewer can be made of this material."



LEAGUE OF AMERICAN MUNICIPALITIES

This Year's Big Municipal Convention.

A number of the most important questions involved in municipal administration are to be discussed at the third annual convention of the League of American Municipalities, which will be held at Syracuse, N. Y., September 19-22. The program committee of the league, consisting of Mayor Jones of Toledo, Mayor Flower of New Orleans and Mayor Gray of Minneapolis, have settled upon five topics which will each be given an entire session of the convention for discussion. These five topics are: "The Municipal Ownership of Public Service Industries," "The Contract vs. the Per Diem System for Public Works," "The Collection and Disposal of Garbage and City Wastes," "Public Bath Houses and Play Grounds" and "The Special Assessment System for Public Improvements." Three or four papers on each of these topics will be read to the convention, after which the questions will be discussed generally by the delegates on the floor.

That the consideration of these important municipal problems at this meeting of city officials from all parts of the country will disseminate a great deal of valuable information and result in bringing about improved public service in the various cities represented cannot be doubted. On the garbage question, for instance, which has long been a perplexing one to our city officials, the formal papers are to be prepared by such eminent authorities as Captain F. M. Gibson, deputy street cleaning commissioner of New York city; G. Everett Hill, formerly assistant to the late Col. George E. Waring; Dr. William C. Woodward, health officer of Washington, D. C.; Dr. Quitman Kohnke, president of the health board of New Orleans, and H. J. Gonden, editor of "City Government."

The discussion of public bath houses and play grounds is to be led by Mayor Josiah Quincy of Boston and Mayor Samuel M. Jones of Toledo, both of whom have had much experience in the institution and maintenance of these pleasurable and healthful municipal enterprises. Authorities of no less ability will present the leading addresses on the other topics, the object of the program committee being to bring out at this convention the very best experience and thought on the various subjects by assigning the preparation of the formal papers to city officials who have devoted unusual efforts to the solution of the problems involved.

Aside from the five topics which have been chosen for general discussion, many other important questions of municipal administration will be treated in special addresses to be delivered at other sessions of the convention. The important problem of public water supply, filtration and distribution will be dealt with in addresses by Judge George Hillyer, president of the water board of Atlanta, Ga., and for years a close student of this subject; William R. Hill, chief engineer and superintendent of water works at Syracuse and first vice-president of the American Water Works Association; John C. Trautwine, Jr., chief of the Philadelphia water bureau, and others.

An important feature of the convention will be a joint debate on the municipal ownership of public utilities between Edward W. Bemis of the Agricultural College of Kansas, and Allen Ripley Foote, of Takoma Park, D. C. The discussion of this important question at the session to be especially devoted to it, by the way, will be participated in by Mayors Quincy of Boston, Ashbridge of Philadelphia, Jones of Toledo, Baker of Providence, Weaver of Louisville, Maybury of Detroit, Woodward of Atlanta, Phelan of San Francisco, Akin of Evansville, Mac Vicar of Des Moines, and many other mayors and council members who have given this subject careful investigation.

It would seem from the vast amount of business which the program committee have prepared to bring before the convention that there will be but little time left for the people of Syracuse to entertain their visitors. However, the program is so arranged that during the four days of the convention one afternoon and two evenings are left open for the entertainment features to be provided by the local committee. This one afternoon will most likely be devoted to a carriage drive about the city, a display by the Syracuse fire department and a visit to and inspection of the Syracuse water works. One of the two evenings will be given up to a magnificent banquet, at which the toasts will be responded to by such well known orators as Governor Roosevelt of New York, Governor Pingree of Michigan, Mayor Flower of New Orleans, Mayor Jones of Toledo, Mayor Taggart of Indianapolis, Mayor Driscoll of New Haven, Mayor McGuire of Syracuse and Mayor Perry of Grand Rapids.

Work of the League of American Municipalities.

As a direct result of the work of the League of American Municipalities, through its two conventions and its permanent bureau of information in New York city, municipal electric lighting plants have been established in Cumberland, Md., Grand Rapids, Mich., Evansville, Ind., Houston, Texas, and Columbus, Ohio. The mayors and council members of these cities were prompted to establish these public lighting plants by the information they received through their membership in the league, and the good example set by them is undoubtedly to be followed by many of the other officials in the organization. Among the other cities which have been interested in municipal ownership through the work of the league, and which are now endeavoring to put in public light or water plants, are Atlanta, Ga., Cedar Rapids, Ia., Des moines, Ia., Fargo, N. D., Independence, Mo., Mount Sterling, Ky., Syracuse, N. Y., Toledo, O., Holyoke, Mass., Florence, Ala., New Haven, Ct., Lima, O., Zanesville, O., Elmira, N. Y., Perth Amboy, N. J., Ironton, O., Dubuque, Ia., and Corinth, Miss.

Another important work accomplished by the league is the reduction of asphalt paving prices in a number of cities where the Trinidad asphalt monopoly existed until the dissemination of information by the league introduced competition. By the breaking up of various local asphalt monopolies thousands of dollars have been saved to property owners.

As the result of information received through the league many cities have improved their street cleaning service, secured better methods for the collection and disposal of garbage, saved money in the letting of contracts for supplies and construction, exacted a fair remuneration for franchise rights granted, brought about a reduction in telephone, light and water rates, made their fire and police departments more efficient, and in a number of other ways profited from the experiences of one another.

Above are enumerated some of the most important achievements of the organization since it was formed two years ago. To complete the list by adding all of its lesser deeds would be an unnecessary task. Enough has been shown to more than justify the existence of the League and assure its future growth and prosperity.

Although the discussion of municipal problems at the conventions of the League is far reaching in its results, the work of the organization does not end there. The League of American Municipalities is alive and active every day of the year. It maintains a central office in New York city throughout the year for the collection and dissemination of information relating to municipal affairs. This office is continually at the service of the mayor, every council member and every department head of every membership city. During the past two years it has received and furnished replies to over 2,500 special inquiries. The League's bureau of information deals only in facts; it has no authority to issue opinions and theories. It acts merely as a medium through which the experiences of municipalities are interchanged.

The membership of the league now includes nearly all of the large cities of the country and scores of the smaller municipalities. A few cities have been kept out of the organization through the influence of officials who make the municipality subservient to municipal monopolies, but fortunately city officials of this class are rapidly disappearing from places of power.

—City Electrician Ellicott, of Chicago, states that the cost of each street arc light furnished by the municipal plant since January last has been at the rate of $55 a year. In making this figure, he has probably not taken into consideration charges for interest and depreciation.

—The National Electric Light Association, at their recent convention in New York, elected the following officers for the ensuing year: President, Gen. S. T. Carnes, Memphis, Tenn.; first vice president, O. T. Crosby, Washington, D. C.; second vice president, J. B. Cahoon, Elmira, N. Y.; members of the executive committee, E. F. Peck, New York, William M. Brock, Patterson, N. J., C. E. Scott, Bristol, Ct.

FIRE DEPARTMENTS.

Fire Chief's Annual Convention.

This year's convention of the International Association of Fire Engineers will be held at Syracuse, N. Y., as stated in the last issue of City Government. The convention will open on August 22 and continue four days. The executive committee have selected the following topics for discussion:

No. 1—The propriety of attaching automatic nozzles to stationary standpipes in high buildings, and the better method of applying and using same.

No. 2—Scientific head protection, or the best method of entering and combating smoke in the locating and fighting of fires.

No. 3—The dangers to be encountered and the best method of fighting fires, produced, or likely to occur from acetylene gas or calcium carbide.

No. 4—Will auxiliary or automatic fire alarm systems connected with the municipal electric systems materially aid or retard the efficiency of well organized fire departments?

No. 5—Reminiscence of forty years' experience in fire fighting, with the increased dangers and facilities of combating same.

No. 6—What are the increased benefits of the storage battery for fire alarm systems?

No. 7—What is the most practical fire fighting apparatus for small places having no water works?

No 8—Essay on modes of fighting fires in wooden cities for volunteer firemen.

The following resolution will be recommended for adoption by the convention:

Resolved, That the board of directors recommend that the precedent heretofore established of electing as president of this association the chief where the meeting is held be discontinued. Instead of being made president he be made a life member.

Boston Salt Water Pipe System.

The salt water pipe system of Boston, which was fully described in a special article contributed to a recent number of "City Government" by Captain William Brophy, was given a severe test by the fire department a couple of weeks ago. Of the test, the Boston "Herald" says editorially:

"The test of our new system of salt water fire defence, which was given by the fire department on Sunday, was highly satisfactory, and proves that as a secondary, and possibly as a primary, supply this system of piping for salt water is exceedingly effective. The expense of laying these pipes was only a small item in the annual municipal outgo, and it may be affirmed that, considering the effectiveness of this method for fire preventive purposes, it is doubtful if the city ever obtained so large a return for the money expended. It was demonstrated by the test on Sunday that, apart from the concentration of one or two enormous streams of water intended to deluge a great fire, it was possible to maintain nine independent streams of water, each having great power and flooding capacity, with a height far above the buildings in the immediate vicinity. The water in this system of pipes, we need hardly inform our readers, was obtained through the pumps of the fire boat stationed at Central wharf, taken directly from the dock and delivered in large quantities by the engines of this marine auxiliary of the fire department."

Mashalltown Fire Department.

The annual report of David Coulton, chief of the volunteer fire department of Marshalltown, Ia., says that the force consists of the fire police, one hook and ladder company and six hose companies, with a total membership of 149. The apparatus consists of two hook and ladder trucks, six hose carts, all with equipments, and about 4,500 feet of cotton and linen hose. During the period between March 14, 1898, and April 1, 1899, the department has responded to 35 fire alarms. The total amount of property destroyed by fire and water during this period, as claimed by the owners, was $3,345.00, on which insurance to the amount of $2,516.50 was paid, leaving a total loss of $828.50.

New York's Big Fire Force.

The following statistics of the fire department of Greater New York have just been compiled:

MANHATTAN AND BRONX BOROUGHS.

Uniformed force, officers and men	1,223
Uniformed force on fire boats.	26
Apparatus in service:	
Marine fire boats	4
Steam engines	69
Hook and ladder trucks	31
Hose wagons	61
Hose tenders	10
Boat tenders	2
Water towers	3
Chemical engines	5
Combination engines	2
Fuel wagons	23
Hydrants and alarms:	
Hydrants	11,500
Fires	4,239
Indications of fires	176
Unnecessary alarms	305
Number of feet of hose in service	250,000
Number horses in service	550

BROOKLYN AND QUEENS BOROUGHS.

Uniformed force	989
Ununiformed	10
Apparatus in service:	
Marine fire boats	2
Steam engines	70
Hose tenders and wagons	79
Chemical engines	2
Water tower	1
Fuel wagons	12
Hook and ladder trucks	18
Combination engine and truck.	9
Hydrants and alarms:	
Hydrants	8,130
Fires	2,203
Indications of fire	54
Unnecessary alarms	78
Loss	$1,210,598
Number feet of hose in service	133,850
Number horses in service	370

VOLUNTEER SYSTEM, RICHMOND BOROUGH.

Number of companies	40
Number of officers and men	2,023

VOLUNTEER SYSTEM, QUEENS BOROUGH.

Number of companies	63
Number of officers and men	2,023

Montauk Cable Installations.

The Montauk Automatic Thermostatic Fire Detective Cable covers a field which heretofore, electrically speaking, has but tentatively been occupied. Anything that has true intrinsic merit must grow despite all difficulties encountered. The cable requires no exterior aids; the fact that it accomplishes certain results, and that it is based on a natural law, renders it indenpendent of exterior support such as is usually sought for by devices intended to accomplish, in a measure, like results. It is because of these features that the installations of this cable are rapidly multiplying.

Messrs. Stanley & Patterson, of New York, a firm well known to the electrical trade and jobbers in this cable, among other installations, have recently placed a nequipment in the home of Mr. Joseph Pulitzer of the New York "World;" the firm of Doscher & Hartwell, electrical contractors, among other installations, have recently equipped the winter residence of Mr. George Taylor in New York city, and also his summer residence on Long Island; the Jenney Construction Company, Haveneyer building, are doing a prosperous business in the installation of this cable, and among the many installations made by them may be mentioned the winter and summer residences of Mr. A. Cowles, president of the Ansonia Brass and Copper Company.

Among the various installations made by the Gamewell Auxiliary Fire Alarm Company, the Dundee Chemical Works, Passaic, N. J., and the Jessup & Moore Paper Mills, Welmington, Delaware, may be cited.

Fire Department Items.

—At the recent annual convention of the Texas State Firemen's Association, held at Paris, the following officers were elected: Lee Roundtree, of Taylor, president; William Abernathy, of McKinney, R. C. Van Gilesen, of Weatherford, J. O. Hammett, of Waxahachie, and Ham Metz, of Austin, vice presidents; J. H. Storey, of Lochart, treasurer; J. Ellis, of Dallas, recording secretary; W. P. Walker, of Luling, corresponding secretary; O. A. Perry, of Paris, delegate to the convention of the International Association of Fire Engineers. Waxahachie was selected as the next annual meeting place.

—T. C. Gleason has been selected chief of the fire department of Ware, Mass.

—C. A. Cutler has been elected chief and J. Lycett assistant chief of the fire department of Warren, Mass.

—The convention and tournament of the Vermont State Firemen's Association will be held at Bennington on July 19-20.

—Chief C. Otte, of the fire department at Hastings, Minn., has retired after thirteen years of service. E. Cobb is the new chief.

—Eddy, N. M., has a fire department of thirty-four members. The officers are: Chief, W. L. McEwan; assistant, W. E. Orr; secretary, A. Beeman; treasurer, T. F. Blackmore.

—The annual report of Chief J. Hodgins, of the Marinette, Wis., fire department, shows total expenditures of $11,038.11 for the year. There were 97 alarms and the total loss, covered by insurance, was $14,950.53.

—The new officers of the Territorial Firemen's Association of Oklahoma are: President, Perry Welty, Perry; vice president, C. G. Bible, Norman; secretary, Z. E. Dryer, El Reno, and treasurer, H. C. Olds, Guthrie.

—The Wisconsin Firemen's Association will have their annual convention and tournament at Columbus, June 20-23. The tournament of the Iowa Firemen's Association will be held at the same time, at Missouri Valley.

—North Tarrytown, N. Y., after having investigated the various makes of hook and ladder trucks, has just awarded a contract to the Seagrave Company for one of their well known city service trussed hook and ladder trucks with complete equipment.

—The council of Beaver Falls., Pa., after a year or two of observation of the working of "Quick As Wink" coupling on fire hose in nearby towns, has voted to adopt such couplings, and has placed its order with the Chicago Fire Hose Company, for hose with "Quick As Wink" couplings.

—The Eastern District of Illinois Firemen's Association, embracing the counties of Effingham, Moultrie and Champaign, has been organized with the following officers: President, M. F. Quirk, Arcola; vice president, W. E. Hart, Charleston; secretary, O. W. Hill, Tuscola, and treasurer, John Boyle, Champaign. The organization is an auxiliary to the Illinois State Association.

—Chief J. E. Shaub, of the fire department of Piqua, Ohio, has submitted his report for the year ending April 1, 1899. It shows that there are ten men in the department, including the chief, and the annual expense amounted to $7,436.82. During the year there were 39 alarms; total loss, $7,644.03; insurance paid, $7,408.77; value of property involved, $160,987.30. The chief recommends the purchase of three horses and 100 feet of hose.

—The following statistics are given in the annual report of the Kansas City, Mo., fire department: Total number of alarms, 974; increase of former year, 157; loss on buildings, $197,736.24; loss on contents, $334,151.93; total loss, $530,888.17; increase loss over former year, $217,677.44. Total amount of insurance on property involved, $4,613,766; average loss per fire during the year, $610.66; number of fires extinguished with extinguishers alone, 309; fires extinguished with chemical tanks on combination wagons, 37.

—The American Fire Engine Company, of Seneca Falls and Cincinnati, during the past week shipped complete outfits, consisting in each case of a steam fire engine, hose, hose carts, etc., to Arecibo, Porto Rico, and Guayaquil, Ecuador, and received still another order from the latter city for a double extra first size Metropolitan engine. This will make the third steamer exported by the American Company to Guayaquil, and as that city has also machines of English manufacture in service, the placing of additional orders in this country speaks well for the American engines.

—The Connecticut State Firemen's Association, at their annual convention in New London last month, elected the following officers: President, George S. Pitt, of Middletown; first vice president, George Bowman, of Stamford; county vice presidents, New London, George Rogers, of Norwich; Hartford, John R. Davis; New Haven, Joshua G. Gladwin; Fairfield, David W. Harford; Tolland, Joseph Foster; Windham, Fred S. Young; Middlesex, John O'Brien; Litchfield, Thomas A. Gatsell; secretary, John S. Jones of Westport; Treasurer, Samuel C. Snagg, of Waterbury; delegate to International Association of Fire Chiefs, John Stanners, of New London. Next year's convention will be held at Wallingford.

DEPARTMENT OF INQUIRY.

The editor of CITY GOVERNMENT will undertake to furnish, through this department, replies to all inquiries pertaining to municipal affairs sent in by subscribers. The names of inquirers will not be published in any case.

Excavating in Paved Streets.

Do you know of any city with an ordinance requiring that all openings or excavations in paved streets shall be made by the municipality itself? If so, please give form of such ordinance.

Fargo, N. D., is one of a number of cities having such ordinances. We give the Fargo ordinance in full:

It shall be unlawful for any person, persons, firm or corporation to open up or make any excavation in or upon any of the paved streets, avenues or alleys in the city of Fargo for the purpose of making any connection or repairs with any sewer, water or gas pipe or main, or constructing any sewer, water, gas pipe or other underground conduit without first having obtained a permit to do so as hereinafter provided.

Whenever any person, persons, firm or corporation shall desire to open up or excavate any portion of any paved street, avenue or alley for the purpose of connecting with or making repairs of any sewer, water, gas pipe or main in such street, avenue or alley, or construct any other underground conduit, shall make first an application to the city auditor, setting forth in detail the purpose for which said person, persons, firm or corporation desires such an opening or excavation, kind of pavement, sidewalk, and curbing to be broken into, and a description of the property by lot, block and addition opposite which such excavation or opening is to be made. The auditor shall immediately upon the receipt of such application furnish a duplicate of such application to the city engineer, who shall within twenty-four hours after he has received a copy of such application make out and file with the city auditor an estimate of the cost of the opening or excavation, including the refilling and laying in as good condition as before all pavements, sidewalks and curbing so broken or opened up. After such estimate has been filed by the city engineer, the person, persons, firm or corporation shall deposit the amount of such an estimate with the city auditor, as full payment for the labor and material and the full performance of the work for making such an opening, excavation, connection or construction, including filling and replacing said pavement, sidewalk and curbing. After the applicant has deposited the amount of the estimate as herein provided, the street commissioner shall at once, or as soon thereafter as possible, not exceeding twenty-four hours, employ such a person or persons as are competent to do the work provided for in this ordinance subject to the approval of the city engineer; whenever such work shall have been completed, the labor and expense for the performance of such work, including the furnishing of material, shall be paid by the city auditor out of the money deposited by the applicant, as herein provided, for the labor performed and the material furnished, after the bill for the said work and material has been properly verified by the parties so performing the work and furnishing the material, and duly approved by the city engineer. Any surplus, if any, to be returned by the city auditor to the applicant.

All excavations made as hereinbefore mentioned shall be made under the direction of the city engineer and done in a most careful and workmanlike manner. All paving, sidewalk and curbing shall be carefully removed in such a manner as to cause the least injury or damage to the paving, sidewalk and curbing not removed. All dirt excavated shall be placed back into such excavation or opening in such a manner as directed by the city engineer; all paving, sidewalk and curbing shall be replaced and put in as good condition as it was before said opening was made. At no time and in no case shall more than one-half the width of the street be opened up. All such openings shall from sunset until sunrise have displayed at a conspicuous place or places not less than two signal lights, and as many more as may be ordered by the chief of police, warning people against danger; all openings and excavations shall be made in such manner as to cause the least obstruction to the use of said street, avenue or alley, and shall not remain open any longer than is absolutely necessary to make the connection and complete the work.

Any person, persons, firm or corporation violating any of the provisions of this ordinance shall be subject to a fine of not less than twenty-five dollars nor more than one hundred dollars for each and every violation.

A Good Curfew Ordinance.

In response to several inquiries for the form of a curfew ordinance, we publish below the enactment of the St. Joseph, Mo., council, which has been enforced with good results.

It shall be unlawful for any person under fifteen years of age to be or remain in or upon any of the streets, alleys or public places in this city at night after the hour of nine o'clock p. m., from March 1st to August 31st, inclusive, of each year; and from September 1st to the last day of February, inclusive, of each year, after the hour of eight o'clock p. m., unless such person is accompanied by a parent, guardian or other person having the legal custody of such minor person, or is in the performance of an errand or duty directed by such parent, guardian or other person having the care and custody of such minor person, or whose employment makes it necessary to be upon such streets, alleys or public places during the night time after said specified hours: Provided, this exception shall not apply when the person under such age shall be playing or unnecessarily loitering in or upon any such street, alley or public place, whether alone or accompanied by a parent, guardian or any person or persons whomsoever. Any person violating the provisions of this section shall be deemed guilty of a misdemeanor.

It shall be unlawful for any parent, guardian or other person having the legal care and custody of any person under fifteen years of age, to allow or permit any such child, ward or other person under such age, while in such legal custody, to go or be in or upon any of the streets, alleys or public places in this city within the time prohibited in section eleven of this ordinance, unless a reasonable necessity exists therefor. Any person violating the provisions of this section shall be deemed guilty of a misdemeanor.

The police are hereby authorized to arrest, without warrant, any person willfully violating the provisions of section eleven of this ordinance, and detain such person for a reasonable time, in which complaint can be made and a warrant issued and served. No child or minor person arrested under the provisions of this ordinance shall be placed in confinement until the parents or guardians of such person shall have been notified of such arrest and shall have refused to be held responsible for the observance of the provisions of section eleven of this ordinance by said minor person.

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SPECIAL NOTICE

City officials and friends of City Government visiting New York are cordially invited to make the office of City Government their headquarters during their stay in the city. Desks, stenographers and stationery are placed at their disposal, and their mail may be addressed in our care.

WANTED—A few copies of City Government of November, 1896, for which 25 cents a copy will be allowed. City Government Pulishing Co., Troy, N. Y.

THE FRANCHISE TAX LAW.

While the will of the people of the Empire state to place a proper share of the tax burden upon corporations using the public thoroughfares has found expression through the passage of a franchise tax law, it is doubtful whether the act will ever amount to anything more than a mere expression of popular sentiment. That the recently passed tax bill will ever bring about the results intended for it to achieve is entirely questionable. The practiced and cunning hand of the corporation lawyer is visible in the matter, and the dire consequences of its work may be anticipated.

The original Ford bill may have been somewhat crude, but in soundness it was immeasurably superior to the voluminous and uncertain bill substituted for it by Governor Roosevelt.' The first act was a plain amendment to the tax laws of the state and its constitutionality could not be attacked. It merely defined as real estate the public property used for the operation of private business. The governor's bill, for the enactment of which the legislature was convened in extraordinary session, does the same thing, and in that respect it is sound.

Passing over several minor defects in the new bill, let us come to its chief fault —that of vesting in a state official the functions constitutionally belonging to a municipal official. The constitution of New York state says that all city, town, and village officers, whose election or appointment is not provided for by the constitution, shall be elected by the electors of such cities, towns, or villages, or of some division thereof, or appointed by such authorities thereof as the legislature shall designate for that purpose. Under this provision of the constitution the Court of Appeals held, in the case of People vs. Raymond, that an act of the legislature conferring upon the governor the power of appointing the commissioners of taxes and assessments in New York city was unconstitutional. The new franchise tax act virtually confers upon the governor the power of appointing assessors for every city, town and village in the state when it provides that the assessment of all franchises shall be made by the state board of tax commissioners.

Of all the powers held by city, town and village officers, none can be more important to the citizens thereof than is the power to assess property for taxation. The exercise of this power involves every citizen of a municipality, and it is but simple justice that such citizens should have voice and part in the selection of the officers who determine the amount of taxes they must pay. That public property used for private purposes is to be included in the totals of local assessment rolls is an additional argument for the exercise of the principles of home rule in the selection of assessors, because every dollar of taxes collected on account of franchises ought to lessen the burden of the owners of private property.

There seems to be little doubt that the New York franchise tax act can and will be successfully assailed on the point of constitutionality. However, if it should by the liberality of an inconsistent court be declared constitutional, it will remain on the statute books as a pernicious law. That the corporations enjoying valuable rights in public property should be made to pay taxes on their franchises is a just and proper contention, but such a tax should not be imposed through an act that violates the principles of home rule.

Governor Roosevelt's point that men of virtue and wisdom will always constitute the state board of tax commissioners while such men are not likely to be found among local assessors is not well taken. Governor Roosevelt should bear in mind the fact that he will not remain in the governor's office forever; men less scrupulous than he may by the fortunes of war or politics be placed in the position to appoint state tax commissioners.

AN ECONOMICAL CITY.

The annual address of Mayor Frank G. Pierce, of Marshalltown, Ia., who is now serving his third term, reflects great credit upon those who have conducted the business of the municipality during the past few years. The mayor gracefully passes to the council and the department heads the lion's share of the credit, although the wise and economical management of the municipal service is due largely to his careful and thoughtful leadership. The fact that the per capita tax in Marshalltown is but $2, while in other cities it is generally over $10, is an indication of the virtue of that city's administration. In his message, Mayor Pierce says:

The citizens of Marshalltown do not always appreciate the great heritage that the members of this council in years gone by have given into their keeping, and do not value at their true worth our successful system of water works and street lighting. In these two items our city is second to none in the whole country. We have not only reached a stage where our water works system pays all the expenses of operating, maintainance and extension, but nets the city a good revenue each year, and our street lighting system is so managed that no tax for street lighting is necessary, the small amount needed for this purpose being paid out of the general fund. These two successful enterprises make it possible for our city to have the lowest rate of taxation for municipal purposes of any city in the state of Iowa. I cannot express in words the great obligation that the water works council and the electric light council have placed us under, but their names should be honored by every citizen. And we, the present representatives of the people, should endeavor to follow in their footsteps that we may confer some lasting benefit on our people. And our great opportunity is along the same lines as those of our predecessors. We should carry on the work they began and use every honorable means to obtain control of all the public utilities the value of which depends upon the use of the public streets and the patronage of the people. The streets belong to the people. The value of a street railway franchise or an electric light or gas franchise depends upon the use of the public streets and the intelligence, energy and push of the people. What the people create the people should own and our city should be in these matters as in all others—a leader. We now furnish our citizens an abundance of pure water at a very reasonable cost, and light them on their several ways the night through at no material increase in taxes, and the next thing that should receive out attention is the matter of furnishing them with a cheap and satisfactory light for domestic purposes. The corporation which now controls this part of our interests has violated every principle of fairness and justice. They have repeatedly and flagrantly violated their franchise, they brow beat and coerce our citizens, they rob our people by exorbitant charges, and if a voice is raised in protest it is met by insult and abuse. Our greatest pleasure should be in the improvement of the material interest of our city and citizens, and we should at once, and with the greatest vigor, take up the matter of furnishing light to our citizens. The present lighting franchise has been violated so persistently that we need not consider it in the least. If, when we begin our work along this line, the company should raise an objection any court in the land would hold the franchise annulled and of no force. In this view most of our citizens and attorneys agree. The people and merchants are all of one mind upon this subject that we should take some action on this matter.

With a mayor who puts such fearless and truthful statements in his official message, it is no wonder that Marshalltown enjoys a tax rate which seems ridiculously low when compared with that of other cities.

UNPREPARED FOR SMALL POX.

In the city of Rochester, N. Y., during the past twelve months, but nine weeks have elapsed when there has not been one or more cases of smallpox in the pest house. This house or hospital is a one-story structure composed of two rooms, one a male and the other a female ward. Next to the male ward, separated by a door, is the living room of the keeper, in which the cooking is done for the patients and the suspects as well. Outside of the hospital and within twenty feet of it, two temporary unceiled and unplastered structures have been erected for the detention of suspected cases who cannot be properly quarantined in their own homes. Those two structures would accommodate on a pinch not more than ten people. The batning and water closet facilities are entirely inadequate. The hospital and the outlying buildings are situated not more than twenty-five feet from what is known as the river road on the outskirts of the city, fronting the canal feeder and the Genesee river. During the warm months this road is frequented by boys and men fishing in the feeder and in the river. Many of the passers come in close proximity to the hospital.

In view of the reports coming from the South and West, in Virginia, Florida, Ohio, Michigan and other states, where in the last few months many hundreds of cases of smallpox have been reported, making a total of thousands of cases, it seems little short of criminal that something should not be done by the authorities toward providing suitable accommodations both for patients and suspected cases. Many of the cases of smallpox that occur do not get into the public reports. In the state of New York several hundred cases have occurred in the last year. Some of them at least have not got into the public medical reports. If this is so, there are a larger number of cases in the sparsely settled districts in the South and West which are not reported at all.

As smallpox usually shows a more marked rise in the second year of its epidemic occurrence than in the first year, it is reasonable to expect a larger number of cases in the next year than in the one just past. In view of this, it is but just to the citizens that better provisions should be immediately made for the occurrence of smallpox and for the quarantining of suspected cases in all of the cities of the country.

The city of Buffalo, with its otherwise model health department, is nearly as badly off for handling its smallpox cases as Rochester. The health officers of these respective cities, Drs. Wende, of Buffalo, and Goler, of Rochester, are in no wise to blame for these conditions. Through their earnest and persistent efforts this evil is in a fair way to be remedied within the year.

There is a general unreadiness throughout the country to cope with an outbreak of smallpox, which demands greater vigilance and more effective service on the part of health officers and state boards of health.—W. S. C.

EDITORIAL COMMENT.

Mayor Jones of Toledo has been held up by some newspapers as a dangerous man for other mayors to follow. Why? Is it because, as an independent candidate, he gets 17,000 out of a total of 24,000 voters to endorse his policy?

No better example of the superiority of municipal over contract work is needed than the change in the condition of the streets of Brooklyn since April 1, when contract sweeping in that borough ceased. Brooklyn people are doubtless willing to pay more taxes, if necessary, to continue the good work of municipal street cleaning.

The annual report of the police commissioners and of Superintendent of Police D. S. Gaster of New Orleans shows not only that the force is inadequately paid, but that it is by no means large enough to cover the territory. On an appropriation of only $225,000 a force of 323 men is maintained to cover an area of 197 square miles.

Governor Roosevelt says: "The question of municipal ownership cannot be raised with propriety until the governments of all municipalities show greater wisdom and virtue." The Governor is evidently not aware of the fact that less "wisdom and virtue" have been displayed by municipalities in granting franchises to private companies than in managing publicly owned industries.

The total amount received during 1898 by the city of New York from street railway companies, for car license fees and percentages, was $347,878.25. Of this sum $314,947.02 came from companies operating in Manhattan Borough, and the balance from Brooklyn. The car license fees amounted to $68,960.00, and the percentages on gross receipts to $278,918.25.

To be of real service to the corporations, the New York Times occasionally ought to show some slight regard for the interests of the people in its editorial utterances. The constancy of the Times in its devotion to the interests of the franchise grabbers causes the people to surmise that the financial backing and the editorial expressions of the newspaper come from the same source.

Grand Rapids, Mich., council has just granted a franchise for a new belt line railway, and the ordinance provides that the grantee shall pay to the city an annual license fee of $5 on each motor operated and the further sum of 2 per cent. on the gross receipts of the business. Grand Rapids has gone out of the business of giving away the people's property.

The city of Columbus, Ohio, has discarded the contract system as to street cleaning. Director of Public Improvements Kauffman has been authorized to purchase a plant and carry on the cleaning of the streets as a municipal work. This change is made partly because the contractors heretofore doing the work have not given satisfactory service, and partly because a saving of money is anticipated under the new system.

Mr. Charles D. Fenhagen, who has served with marked ability for some years as comptroller of the city of Baltimore, retired from office last month. He is a studious, careful man, and his official record is a credit to himself and a satisfaction to the people of Baltimore. Mr. Fenhagen has been elected secretary and treasurer of the International Trust Company of Maryland; his ability, integrity and geniality will bring him continued success.

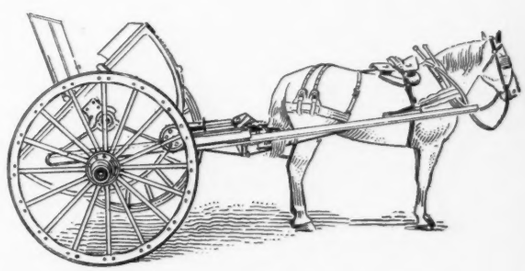
Mr. Carroll D. Wright's labor bureau, supported by the United States government, thanks to the indulgence of a much abused public, has for about three years been gathering statistics on municipal and private ownership of public service industries. At the rate the work is progressing some of us hope to see the statistics published during or about 1912. The publishing of the report will provide considerable work for printers; therefore it deserves encouragement.

In another column will be found a paper on the use of heat from garbage cremation for steam generation by A. H. Campbell, A. M. I. C. E., reprinted from the London "Surveyor." From a careful reading of the paper we must conclude that the prediction made in 1893 "that the refuse of an ordinary town is quite sufficient as a rule to provide all the light and power required" does not seem probable of realization. We must, nevertheless, admit that there is in the wastes of a city a certain power producing value greater than the cost of the additional installation required over the ordinary garbage crematory to render it available.

It will be entirely in line with wise business management for the Brooklyn street railway companies to sprinkle the roads over which their cars are run to the various seaside resorts. Now that the electric street car sprinkler has been invented and successfully operated it is within the power of street railway companies, through the use of these sprinkling cars, to wet down the streets where their tracks lay at small expense. While the travel through Brooklyn to seaside resorts is very heavy, there is no doubt that many people remain at home in preference to enduring the dust nuisance encountered during the course of a trolley ride, and it is more than probable that the street car companies would be amply compensated in increased traffic for the expense of skrinkling their roadways. What is true regarding the Brooklyn trolley roads in this respect will apply also to the street railways in other cities.

SANITARY GARBAGE VEHICLES.

The sanitary collection of garbage, night soil, material from sewer inlets and other refuse is one of the most important duties devolving upon city and town officials. Whether this work is done by the municipality itself or by private contractors, officials should insist that these germ bearing, noxious and disagreeable materials should be conveyed through the streets in vehicles so constructed that the escape of dangerous gases and filthy liquids will be absolutely impossible. It has been contended by contractors in some cities that there is no perfectly sanitary wagon, and frequent inquiries have come to this office on the subject, displaying a disposition on the part of both contractors and officials to use sanitary vehicles if they can be found on the market. After careful investigation, this paper finds the vehicles manufactured by the United States Sanitary Company, of Washington, D. C., worthy of recommendation from both sanitary and economical standpoints. Being constructed of steel, these vehicles do not absorb moisture, are as near as possible air and water tight, easily cleaned and sightly in appearance. A good idea of the construction of these vehicles is given by the accompanying illustration. The United States steel vehicles are made in various sizes, the smallest having a tank capacity of 37 cubic feet. The larger wagons are made with three or four wheels, but are built on the same principle as the two-wheeled cart shown in the illustration. To those who are seeking a sanitary method of garbage collection, we suggest communication with the United States Sanitary Company.



PAVING AND SEWERS.

Methods of Paying for Local Improvements.

In Wheeling, W. Va., a general tax of 10 cents on each $100 of assessed value is levied for local improvements every year. With a view to furnishing information which might enable his city to devise some new method of paying for its street improvements, City Engineer A. L. White, of Wheeling, has secured reports from 67 cities of under 100,000 population showing their methods of paying for municipal improvements. The reports show that 84 per cent. of these cities pay for sewer construction by special assessment while 16 per cent. pay the total cost by general levy on all taxable property. By the assessment plan the usual method is to assess cost according to frontage. It is customary to assess cost of trunk sewers upon either area drained or the entire city, but in many cases only cost in excess of a lateral or small sewer is so charged. The reports also show that 82 per cent. of the cities pay for street paving by special assessment; also that 31 per cent. of the cities build the sidewalks, but that in almost all cases abutting property owners pay the cost. Mr. White, in commenting upon the data he has compiled, says:

"The fact that a large majority of cities have adopted the assessment plan raises a strong presumption in its favor; and while these facts do not prove conclusively that the assessment plan would be best for Wheeling they are certainly sufficient to justify us in calling in question our present system; and to make a thorough investigation of the entire subject.

"I will take the liberty to outline what I conceive to be some of the disadvantages of the present system and advantages of the assessment system: All taxes should be levied upon property in proportion to benefits; the present 10-cent levy in Wheeling violates this principle. While property, both real and personal, is assessed 10 cents on each $100.00 for new work, only a very small proportion receive the direct benefits of the improvements. The 10-cent levy fund amounts to about $23,000.00 per annum. Most property has been paying this tax for years without improvements, and under the present system, will so continue to pay for many years for improvements to other people's property while their own remains unimproved. If all streets and alleys in the city could be improved at once by general loan, the objections would not be so serious. But as the cost of building sewers, curbing and paving, the entire city would be perhaps $1,500,000.00, this plan would not be practicable. Only about one-fourth of the city streets are paved with brick and many of these are now worn out and will have to be re-paved soon. Under present system it would probably take 50 to 60 years to pave and sewer the city, provided no old streets are repaved, and it is safe to say that, under present system, the city will never be entirely sewered or paved, although all will have to pay the same tax year after year. By the assessment plan, the property owners on each street can decide for themselves whether they want the street improved or not. Should those owning most of the abutting property petition to pave the street, the city can have the work done and assess cost upon property according to benefits.

"All pipe would be first laid and service pipe extended to curb, and charged to the property owner with other costs, before paving. This would remove the necessity of digging into the paved streets to a great extent. There is perhaps, not a street in the city that has not been dug up for service connections, etc., within 12 months after being paved. If property owners pay directly for the improvements in front of their property, the ywould take a more lively interest in the character of the improvements, and would aid in keeping them in good condition.

"It is customary in most cities having the assessment plan, for the city to pay for a portion of the paving, ranging from 2 per cent. to 50 per cent. of cost, on the ground that the city at large is benefited as well as the abutting property. However, it seems to me that if the city properly cleans and maintains the streets, after being paved by the property owners, its financial obligations would be as great as should be assumed.

"The objection that is usually made to a change is, that it would be unfair to those who have not yet received any street improvements, although paying same rate for many years, as those who have had improvements. If there was much probability that the improvements would be made this generation, by continuing present system, this argument would have more weight. When streets that are now paved are repaved, the cost would be assessed upon abutting property owners the same as unimproved streets. Those that have improvements would have a few years' start.

"Many advantages would be obtained by the city laying all sidewalks when curb is set and charge same to abutting property owners. We would have more and better sidewalks. Work of same quality could be done cheaper because work would be let in one large contract. The paving would also be uniform on each block."

Rochester's Paving Troubles.

The city of Rochester is having more trouble with the paving question. By a recent act of the Legislature, affecting cities of the second class, the eight-hour day has been made obligatory for all contract labor for the city. This, very naturally, has increased the expense for laying pavement, as the men in the service of the contractors cannot do the same amount of work in eight hours which was formerly done in ten and twelve.

As a direct consequence the price for laying pavement would necessarily be increased, and the companies submitting bids therefore took this into consideration and raised the price, it is stated, from 35 to 40 per cent. The difference of opinion is about the disportionate advance. Those in opposition say that the advance should not exceed 22 per cent., as that would fully allow for the difference in the length of a day's work.

Sewer Assessment Decision.

No subject is more complex and liable to legal entanglements when tested in the courts than that of sewer assessments. Any evidence as to what is good or bad practice should be read with interest. A recent decision of the Supreme Judicial Court of Massachusetts in the case of J. Montgomery Sears, Joseph H. Beale and Frank Brewster, et al., trustees, vs. the Board of Street Commissioners of Boston has declared the present method of sewer assessment illegal and unconstitutional, and by this decision all sewer work in Boston has come to a standstill and 750 employees of the city department are thrown out of work until the Legislature can take action on an amended assessment law.

The law under which the Board of Street Commissioners acted in making the sewer assessments is statute 1897, chapter 426. Sections 7 and 8 of this act specify the manner of making the assessment and as on these sections the constitutionality of the whole law is attacked we quote them as follows:

Section 7. The Board of Street Commissioners, with the approval of the Mayor, shall annually, before the first day of July, determine just and equitable sewerage charges to be paid by estates in said city for the construction, maintenance and operation of the sewerage works, taking into consideration in determining the charges the necessity of the works as caused by each estate, the amount of use thereof, if any, by the estate or its occupants, the benefit received therefrom by the estate, the amount of any assessment for a sewer paid by any owner of the estate, the length of time which has elapsed since such payment, and the use, if any, that has heretofore been made of the sewerage works by the occupants of the estate, and such other matters as they shall deem just and proper. The determination of such charges as aforesaid shall be final in all cases, and the amount thereof as determined for each estate shall be a lien thereon until paid, and said board shall notify the Board of Assessors of said city of the amount thereof forthwith after it has been determined, and the same shall be included in the next tax bill on the estate transmitted by said board to the collector, or in a tax bill therefor, if no other tax bill is issued for such estate, and be collected as part of the taxes on the estate.

Section 8. All sewers and connections ordered to be made in constructing any way under the authority of chapter 323 of the acts of the year 1891, and of acts in amendment thereof or in addition thereto, shall be deemed to be constructed under the authority of this act, and the expense therefor shall not be considered in determining the assessable cost of the work to be assessed under the authority of said acts.

The trend of decisions in the Massachusetts courts have in the past been in favor of a general tax as opposed to special betterment tax. We quote the most important portions of the decision of Judge Knowlton:

It is evident that these provisions cannot stand as authorizing an assessment of a general tax, because the assessment called for is not proportional and equal. The statute not only directs an assessment upon a particular class of property, instead of on all taxable property, but it expressly requires in determining the charges the consideration of facts pertaining to particular

estates in their relation to the charges, and to previous assessments, which prevent the making of a proportional assessment, viewing it as a general tax, and not as an assessment of benefits.

If we treat the determination of these charges as a local and special assessment upon particular estates we have to consider the principles on which such taxation is founded. It is well established that taxation of this kind is permissible under the constitution of this commonwealth and under the constitution of the United States only when founded upon special and peculiar benefits to the property from the expenditure on account of which the tax is laid, and then only to an amount not exceeding such special and peculiar benefits. Because the statute purports to give the street commissioners power to levy special assessments on real estate upon other grounds than the receipt of special benefits, and to amounts beyond the amount, if any, of the special benefits and for expenditures which, as against such property, are not proper subjects for special taxation, we are of the opinion that the statute is unconstitutional.

It was further implied in the decision of the judge that no assessment could be levied without giving the owners of property an opportunity of being heard upon their liability of assessment.

Sanitary Plumbing.

Sanitary plumbing as a science is one of the most important problems that cities have to contend with, but in its advancement, reforms in their application call for a thorough investigation on the part of our boards of health. As to what actually constitutes sewer gas, and whether it is dangerous to the degree that some hygienists claim, is a disputed question, and where doctors disagree it is best to be on the safe side, for it does not seem reasonable that the decomposing matter in our sewers or cesspools can generate a gas that is any way healthful or pleasant, and the system of air flushing and the adoption of devices to prevent such gases from penetrating our dwellings or buildings should be our chief aim.

Some cities, and the writer has in mind two, viz: Springfield, Mass., and Portsmouth, Va., do not permit the use of traps on main soil pipes, but require them to be open from their connection with sewer or cesspool to their outlet through roof, thus making every building a ventilator for the sewer, a matter which the sewer builders should attend to instead of the house owners, but they require every fixture within the house to be trapped, as it should be in any case. But does it occur to them that a house or perhaps a room may be unoccupied for a few weeks, in which time the water forming the seal in the trap will be evaporated, permitting the house to be impregnated?

Most of our large cities make it imperative that the main pipe and all fixtures shall be trapped, primarily, to protect the house from the sewer, and the basin outlets from such gases as may generate in the pipes, for soil pipes will foul through adhesion of grease and other matter. Some rules require the trap for the main soil pipe to be placed under sidewalks, others permit it just inside of house wall. We favor the latter place for its convenience in case it requires cleaning out; it can be suitably boxed and prevented from freezing. We also lean to the protected trap, that is, with the ordinary water seal and tight fitting gate valve behind it. The valve guards against the foul matter that is liable to collect in the seal, and protects it in case of evaporation or siphonage.

Some experts condemn gate valves as "catchalls" for lint, sticks, etc., but if they are of a proper make the objection will not hold. Just behind the trap should be a pipe leading out to the street just inside the curb; this will give a circulation of air from that point throughout the pipe to its outlet through the roof, reducing to a minimum the foul air that may generate in the pipe. At the lowest fixture should commence an independent iron pipe called a fresh air vent, which should extend through the building and roof, though it may be led into soil pipe for an outlet, but only above the highest fixture in building. To this pipe every individual fixture should be connected by a branch from the sewer side of its trap.

Another important point is that all connections should be by Y branches and no acute angles be allowed, as they act as accumulators. As to the soil pipe, its length through the cellar should slope not less than 1 in 100—1 in 40 or less is better; they are usually carried some five feet outside of walls, and there joined into a vitrified pipe. Right here is where we prefer the iron, for we believe that some soils will permit the pipe to sag and where such is the case the joints will crack and the water will work its way back into the cellars, and some people are always wondering why their house is damp. We believe these suggestions are in part the rules laid down by some cities, but it would seem that our experts might be able to devise some rules that could be adopted uniformally, and as valuable improvements were demonstrated they could be added. We shall be pleased to publish at any time any suggestion that will add to the benefit of this most important city work. —I. F. B.

CITY MAY MAKE FURNITURE.

Director H. Q. Sargent, of the Cleveland, Ohio, public schools, says, in the event of a school furniture trust being formed, that the city may make its own furniture. He added: "The trust hopes to make a big profit by selling school furniture to Cleveland at advanced prices, but it shall not if I can help it. If there is no way to get the better of the combine that puts up prices the city should make its own school furniture. Municipal ownership of a school furniture plant might prove a good thing. It would save the taxpayers many a dollar. The trust, in its greediness, may force this municipal ownership upon the city."

Houston Sewerage System.

The city of Houston, Tex., has recently approved the plan of a system of sewerage for the entire city prepared by Consulting Engineer Alexander Potter, of New York city, and also adopted the method of intermittent filtration for the disposal of its sewage. An election has been called to vote upon an appropriation of $300,000.00 with which to commence the construction of the system as outlined by the engineer. The city has already appropriated $100,000 for a municipal lighting plant. It is proposed to combine the sewage pumping and electric lighting at one central station.

HEALTH DEPARTMENT NOTES.

—The Rochester, N. Y., health department issues a monthly report, including the vital statistics, sanitary inspections, contagious and infectious diseases and biological and chemical examinations of the city's water supply.

— How to take care of babies" is the title of a neat little pamphlet, printed in four languages, and issued under the supervision of Dr. George W. Goler, health officer of Rochester, N. Y.

—The department of health of Buffalo, N. Y., issues a series of pamphlets, in English, Italian, German and Polish, giving general rules for the prevention and restriction of scarlet fever, consumption, diphtheria and also some sensible suggestions for the management of infants during the hot season. These have already born excellent fruit and cannot fail to save many lives.

—Dr. W. A. R. Tenney, health officer of Cincinnati, has taken every precaution possible to prevent a general epidemic of smallpox. At his earnest solicitation all the mail carriers of the postal service have been vaccinated. Besides this he has been most diligent in the enforcement of the compulssory vaccination ordinance as regards school children.

—The city of Buffalo has a health department which is unexcelled. Its superiority is not due to chance, but rather to the intelligent, energetic and persistent efforts of Dr. Wende, the chief of the department. The first few years of his incumbency was a constant running fight. Nearly every radical measure or improvement suggested required strenuous effort to secure its adoption. Five years of practical effort along advanced, and in many cases original, sanitary regulations demonstrated the usefulness of the new methods, by lowering the death rate and largely improving the general health of the city. Now there is much less opposition to meet when changes or something new is asked for. The citizens of Buffalo have come to realize that every dollar invested in the health department yields the best returns. The excellent methods for the filing, classifying and preserving of the multiplied forms of data of a well conducted health department are the work of Secretary Schneider, who is a genius at this class of work. The effectiveness of the department is greatly enhanced by the methods employed. Drs. Bissell, bacteriologist, Gram, registrar of vital statistics, and, in fact, all the members of the force, are models in their various fields of labor. Most cities would do well to inquire into the methods employed in Buffalo.

PREVENTING DISEASES AMONG CHILDREN.

Dr. George W. Goler, health officer of Rochester, N. Y., has paid considerable attention to the preventable diseases among children under five years of age. The success of the methods he has employed is graphically demonstrated by the accompanying table.

DEATH RATE UNDER 5 YEARS—1898.

	Jan.	Feb.	Mch.	Apr.	May.	J'ne.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Avr.
New York	34.2	38.4	38.8	37.5	37.0	36.8	60.0	49.0	44.3	36.8	28.0	27.5	39.02
Brooklyn	30.	32.5	32.1	33.4	32.5	41.8	55.6	54.5	46.0	37.8	28.5	22.5	37.26
L'ng Isl'd City	32.6	30.6	20.0	37.0	36.0	48.7	37.0	52.5	45.0	42.3	30.0	22.5	36.18
Albany	25.5	22.2	23.5	25.0	22.5	28.5	36.0	22.5	26.0	23.0	20.0	19.2	24.49
Yonkers	40.	40.	20.0	35.0	....	34.7	50.0	60.0	42.5	45.0	20.0	25.4	34.38
Troy	13.5	21.0	23.0	18.3	28.0	30.0	40.0	30.0	23.5	31.0	19.0	18.5	24.65
Utica	26.0	15.7	25.0	22.5	23.0	33.0	45.5	42.0	25.0	29.0	12.3	14.0	26.08
Syracuse	16.2	19.5	29.0	21.5	18.5	19.0	40.0	40.5	26.5	16.5	18.3	12.0	23.12
Buffalo	30.0	34.7	27.2	35.0	34.7	30.0	49.5	48.2	44.3	29.2	26.1	21.8	34.22
Rochester	13.2	15.3	25.0	20.4	15.8	19.5	27.6	35.5	24.5	27.0	18.0	13.5	21.27

UTILIZING HEAT FROM GARBAGE CREMATORIES.

BY A. H. CAMPBELL, CITY ENGINEER OF CANTERBURY, ENG.

The subject of this paper is one of intense interest at the present time. The rapid increase in the number of electricity stations throughout Great Britain appears to have given an impetus to the consideration of this subject. The utilization of the waste heat from the cremation of the refuse of a town is a question of a thoroughly economic kind, and of prime importance, therefore, to our municipal economists.

That there is much latent heat and power contained in the cremation of town refuse goes without saying; that there is not so much in it as some of its enthusiasts aver is evident from the very few joint stations which have as yet been erected. Town refuse, like sewage, we have always with us; and as in the purification of the latter disappointment of prophecy has been experienced (so far as profit-making is concerned), so in case of town refuse, it will be well not to indulge too high hopes, nor to hold out too sanguine expectations respecting the power which may be developed for purposes of production of electricity out of the refuse of a town. Nevertheless, there is such a store of power contained in the cremation of refuse as to justify full inquiry and careful research and investigation by those having the requisite facilities of test and observation of the matter. And, at the very lowest estimate, it is the turning to the profitable use of a measure of power hitherto unappreciated or left undeveloped.

The author, feeling in common with many other municipal engineers the strength of this idea, recommended his council when, in 1895, they were considering the establishing of electricity works, to combine therewith a refuse destructor plant; and this advice being confirmed by the councils consulting electrical engineer, Mr. Robert Hammond, M. I. C. E., the combination has been effected, and the works are now erected. The leading principles which governed the design of the buildings and the disposition of the plant therein contained were:

(1) That there should be no possibility of dust from the refuse entering the engine house and so doing damage to the electric plant.

(2) That the dust destructor should work either alone or in combination with the electric plant.

(3) That the capacity of the destructor cells should be such that each day's refuse collection should be effectually cremated within the space of ten hours, beginning at noon of each day and going on until 10 o'clock at night.

(4) That the power developed during the day hours of light load should go to charge the accumulators (a process which I am advised by our resident electrical engineer will take from four to six hours).

(5) That by the time the accumulators are charged the night load will be coming on, and this will more than absorb the power given off from the destructor.

With these five principles, then, before us, a very convenient arrangement of buildings has been adopted, the boiler attached to the refuse destructor being in very close proximity to the cells, and so taking up the maximum amount of heat as the same is given off from the cells.

Although the electricity part of the works has been at work three months now, the author regrets that, owing to the non-completion of the refuse destructor plant, he is unable to include in this communication the tests of actual work; but the same will be most rigorously kept and recorded as an appendix to this paper. The guarantee, however, on the part of the builders of the destructor, Messrs. Beaman & Deas, is as follows:—

Number of cells: Two.

Duty: 15 tons in twelve hours (being at the rate of 30 tons per day), completely destroyed by burning under forced draught to a hard innocuous clinker.

Steam production: The evaporation by the destructor gases alone of 2,800 pounds of water per hour from and at 60 deg. Fahr., and at an assumed pressure of 125 pounds per square inch, being at the rate of 1 pound of steam produced per 1 pound of refuse consumed. This rate to apply to a period of ten hours per day, leaving the remaining two hours as a margin for getting up the heat of the furnace, &c.

Should these conditions be realized (and the builders have no fear that they will not be), what will be the effect? We shall have at Canterbury a power developed out of the town refuse alone equal to 140 indicated horse power for ten hours daily. Unfortunately for the strength of this paper, the author is unable to cite as yet many instances of prolonged working and test of combined electricity and refuse destructor stations. There are, of course, many places where the steam produced is converted into motive power for miscellaneous small uses, such as mortar mill driving, sewage pumping, and such like; but as this paper is directed rather towards the use of the resulting steam for the working of the engines of electricity works, he prefers to limit himself chiefly to that particular field. The following works of a joint kind for the cremation of town refuse and generating station for electricity on a large scale have been erected and at work for some time:—

(1) Oldham (Horsfall Furnace Company).

(2) Shoreditch (Manlove, Alliott & Co.).

(3) Llandudno (Beaman & Deas, Limited).

And as evidence of the widespread belief that there is, if not a wealth, certainly a very great reserve of powers suitable to the generation of steam for electricity works contained in this refuse, when properly cremated, the following towns or districts are, to the author's knowledge, at present pledged to the construction of such joint works—viz., Canterbury, Darwen, Wimbledon, Lambeth, Hackney, Maidstone, Aston Manor, St. Helens (in conjunction with tramways), West Hartlepool and York. No doubt these can be supplemented by the members, and the author will be glad to receive such supplement. St. Pancras, designed as a combined station, is reported of as follows: "The electricity station, which it was hoped to work in combination with our destructor, has never been continuously so worked, as it was not found to be an advantage, owing to the intermittent degree of heat from the destructor furnace."

Dealing now with the foregoing list of works as cited, first of those that have been in operation for some time, the following information may be given:—

OLDHAM.

Lord Kelvin and Professor Barr, in their recently published report on the Oldham destructor, state:—

Refuse consumed per cell per twenty-four hours, 7.96 tons.

Clinker and ashes produced in pounds, one-third (32.9 per cent.), the weight of the crude, unscreened refuse.

Average boiler gauge pressure in pounds, 128 per square inch.

Evaporation per 1 pound of refuse, 1.33 to 0.88.

According to the information given in a paper (3,109) to the Institution of Civil Engineers by Mr. George Watson:—

"The following approximate statement shows the steam now used at Oldham, is being all at about 130 pounds pressure per square inch:—

	Lb. per hour.
Steam from new boiler to electricity station..	2,985
Steam to horse and provender department, say 20 indicated horse power, say....	400
Steam to two mortar mills, say 50 indicated horse-power, say.....	1,000
Steam from old boiler to electricity station, say, in daytime.....	480
Steam jets of all ten cells, say.....	1,800
Total..	6,665

"When the mortar mills and the machinery in the horse and provender department are stopped at night the amount of steam available for the electricity works is 4,685 pounds per hour, or, reckoning 20 pounds steam per indicated horse-power per hour, say 240 indicated horse-power."

SHOREDITCH.

These works, which have been so "boomed" before the municipal world, are, or should be, sufficiently well known to make any description of them in this paper unnecessary; we are concerned rather with the results than with their construction, although, did time permit, and were the occasion suitable, a description of the mechanical details embraced in these most interesting works would well repay consideration.

Mr. Richards, the city surveyor of Sydney, in his report on the treatment and destruction of town refuse, describes these works as a "mechanical miscellany." Be that as it may, the proof of the pudding is in the eating of it; and the burning of the Shoreditch refuse is attended with most profitable results. Illustrative of the power developed and utilized in steam production for electricity purposes, a review of last year's accounts, as published in Lightning, of January 26th last, shows:—

"That the dust destructor has been of material assistance to the electricity works is clearly proved by the low coal bill of .4 cents per unit, this figure being .62 cents per unit below the 1.1 cents per unit of the St. James's Company, the best result now standing to the credit of any metropolitan concern. Accepting this difference as the approximate value of the steam supplied by the destructor, the works costs at Shoreditch would be 1.52 cents per unit and total costs 3.3 cents per unit, on which figures the Shoreditch works would be entitled to the record for metropolitan undertakings.

"The accounts now presented are those of a first year's working; and it is practically certain that if there had been no destructors, and the only fuel employed had been coal, the cost of the coal would have been more than 1.1 cents per unit (the figure referred to by "Chesterfield Junior" as the lowest obtained in any metropolitan station), a figure which, if

it were attained on a first year's working where only coal is employed, would be so far in advance of anything yet done as to be absolutely startling. There is no doubt whatever that the refuse burnt in the destructors at Shoreditch has evaporated more than 1 pound of water per 1 pound of refuse sent to the destructors; while the average work in evaporation done by coal in ordinary electricity stations will certainly not be more than 10 pounds of water per 1 pound of coal, and in many cases will be much less. Taken on this basis, the value as fuel of the 23,137 tons of refuse actually disposed of is equivalent, so far as steam raising goes, to the value of 2,313 tons of coal.

"If the vestry have not obtained the full value of 2,313 tons of coal from it, that arises from one of two causes—either that, though the steam was made, there were no means of using it, or that some of it was made at the time when it could not be used, and there were not sufficient means for storing it. (The Shoreditch Vestry, together with their engineers, perceived the value of thermal storage, and had made preparations for introducing it in their works on a large scale; but, like cautious people, they were unwilling to make such a considerable departure from ordinary practice upon a large scale in the first instance; with the result that, although they possess the means of feeding their boilers with hot water during the time of heavy load, they do not possess thermal storage at all, in the strict sense of the term.) But, however this may be, if the full value of 2,313 tons of coal has not been obtained from the refuse, that is not the fault of the destructor, but simply arises from the condition of the works. Unless this be taken into account, the actual value of destructors as combined with electric lighting stations cannot be properly appreciated. The destructor at Shoreditch has been erected for two purposes: (1) For the destruction of refuse; (2) for the supply of steam. The refuse is there, and must be burnt and destroyed, whether the steam be wanted or not."

LLANDUDNO.

The following particulars of the combined installation at Llandudno have been supplied by the borough engineer, Mr. Stephenson:—

(1) Population: Estimated resident, 10,000; visiting, 22,000—total, 32,000.

(2) Type of destructor: Beaman & Deas, Limited.

(3) Number of cells: Four, in two pairs.

(4) Grate area per pair of cells: 50 feet.

(5) Estimated amount of refuse destroyed: House refuse, 5,490 tons; fish offal, green grocers' refuse, &c., 310 tons—total, 5,800 tons.

(6) Percentage of clinker: 30.5.

(7) Amount of refuse burned per hour per square foot of grate area: 71.7 pounds.

(8) Consumption per hour per pair of cells: 1.6 tons.

(9) Refuse burned per 1 pound of water evaporated: 1.4 pounds.

(10) Steam pressure: Highest, 150 pounds; lowest, 137 pounds.

(11) Power required to drive plan: 7.4 kilowatts.

(12) The total output of the station is 250 kilowatts; 375 horse-power.

(13) The total capacity of boilers, 600 horse-power.

(14) Cost of destructor works, $30,000.00.

HEREFORD.

Mr. Parker, the city surveyor, writes to me as follows: "The combustion chamber is built in front of two Lancashire boilers (22 feet by 6 feet 6 inches), in which, previous to the installation of the destructor, Welsh coal had been used, at a cost of nearly $1,500.00 per annum. Since starting the Meldrum destructor, eighteen months ago, we have not used one ounce of coal or coke, the whole of the steam having been raised from ash-pit refuse."

At Hereford, say Messrs. Meldrum, the makers, exhaustive trials have been made, where it was found 54 pounds of refuse could be burnt per square foot of grate per hour, with an evaporation of 1.82 pounds of water per 1 pound of crude refuse from and at 212 deg. Fahr., giving a total evaporation of 2,980 pounds of water per boiler, per hour, equal to 149 indicated horse-power at 20 pounds of steam per horse-power.

HACKNEY.

In that very able report, drawn by Mr. Robert Hammond, M. I. E. E.., on a combined scheme of electric lighting and refuse destructors for the Hackney Vestry, in the paragraphs dealing with the utilization of heat given off in the burning of refuse, he says:—

"That there is considerable advantage expected from the waste heat is proved by the offers the Hackney Vestry received for their refuse disposal, provided they gave the contractors the benefit arising from supplying electrical energy by a transfer of the provisional order, one of the three offers received being to collect and effectually destroy the refuse for $0.96 per ton" (paragraph 239).

In 1897 there were produced in Hackney some 38,000 tons. The present cost per ton is given by Mr. Hammond as follows:—

Collection:	Paid contractors, say	$1.41
"	Dustmen	.27
		$1.68
Disposal at short		.24
Total cost per ton		$1.92

On this basis alone, then, there would be a saving of $36,936 per annum, estimated at the rate of offer quoted. Could anything be more conclusive of the value contained in town refuse as a generator of steam for electric lighting purposes? But the vestry, prudent as they are progressive, were not to be so tempted, and have decided to retain this gigantic scheme in their own hands; and Mr. Hammond, in his learned and exhaustive report (paragraphs 239-257), reduces his calculations for and against as follows:—

Collection of refuse	$1.20
Burning	.30
Interest and sinking fund	.165
Maintenance	.04
Coal for supplementing refuse	.059
Total cost of collection and disposal by cremation	$1.80
Less—	
Material made from clinker	$ .06
Net value of steam supplied to electricity works	.35
Total	.41
Net cost per ton	$1.39

The net result is a cost of $1.39 per ton for cremating the refuse, against the present cost of $1.92 per ton, being an estimated saving of $0.52 per ton, or about $20,000 per annum, with all the advantages of the better method of disposal.

On the very alluring subject of themal storage, Mr. Hammond (paragraph 251) remarks: "As the business develops, this quantity—viz., surplus energy—will become smaller and smaller. It would appear, therefore, hardly wise to sink capital in extensive storage arrangements in view of the fact that plant for electrical storage is already provided for in the electricity works scheme. This plant can be utilized for storage of the energy arising without incurring a penny of additional capital, whereas if thermal storage were adopted, capital expenditure would be necessary on steam cylinders and on apparatus for utilizing the steam."

SOUTHAMPTON.

A paper on this subject would be incomplete without a reference to Mr. Bennett's work at Southampton. For fifteen years, more or less, continuous work has been done with the steam produced from the refuse of his district, and at the present time he is, I understand, pumping large volumes of sewage by the agency of refuse alone as the fuel for steam generation.

CONCLUSION.

The author has endeavored to present the information to his hand on this subject in as condensed a form as possible; the difficulty has been to abridge it to the degree he would have desired, without doing injustice to the importance of the several works cited. All will agree from the rehearsal of this paper that very considerable power is contained in the refuse and garbage of a town. This refuse must, like the sewage of a town, be disposed of. Do so, then, in the most approved sanitary manner—that is, by cremation; and from the products of its destruction by this method realize what power you can.

This measure of power, by the skillful design and workmanship of the five or six firms now engaging in this important industry, may be more fully developed than it has yet been by perfection of detail in the construction and working of the various parts making up the destructors, so that by the economic utilization of dirt will be droduced the most brilliant and artificial light yet discovered. In such utilization, however, the conditions of perfect and complete cremation must not be sacrificed to the cause of steam production. It is cremation first (and that in a perfect and inoffensive manner) and power second. These two conditions are not necessarily opposed, but are in the main compatible with each other. Take the results of refuse cremation for whatever they are worth, and that is a good deal, especially in localities where steam coal is $4.80 per ton.

Whether we shall ever attain to the prediction of Mr. Manville, the electrical engineer, as recorded in Lightning of March 9, 1893, "that the refuse of an ordinary parish is 'quite' sufficient as a rule to provide all the light and power required," is a matter as yet of opinion. But high ideals beget high results; and the higher the ideal the closer will be the approximation of its conversion into a reality. Professor Forbes beautifully puts the above fact in his Society of Arts lecture, 1892, when he remarked, "It will strike you, as it has struck me, as a very wise provision of Nature, when I tell you that if that refuse (Paddington) were properly burned, and if it were used in the most economical way, it would be found that, assuming the proportion of lighting required for such a population to be, as has been very gen-

erally assumed—i. e., one lamp per head—the amount of refuse provided by any population is almost exactly as much as is required to supply the illumination by means of the electric light to that same population."—London "Surveyor."

AGAINST STATE APPOINTED POLICE.

The brief of City Solicitor Colwell, of Providence, R. I., filed with the judiciary committee of the Rhode Island house of representatives, remonstrating against the passage of the act providing for the appointment by the governor of the state of a board of police and license commissioners for the city of Providence, is a splendid argument for municipal home rule. The brief closes with the following summary:

"The act in question is unconstitutional because the history of the state shows that the four original towns and all towns afterwards founded, possessed and exercised in the fullest degree and in degree fuller than anywhere else was exercised, the right to local self-government; the state has moulded and directed the exercise of this right and has passed laws explaining and sanctioning it at the request of the citizens of the various towns and cities; said towns still exercise this right; they have never parted with their control over the police and other local matters within their respective limits; the state has specifically recognized, enlarged and explained this right and other rights to self-government in the town, afterwards the city of Providence at the request and with the approval of its citizens; and therefore it cannot, without their request and against the protest of the constituted authorities of said city, take away these rights nor authorize the governor to appoint a board of police and license commissioners for the city of Providence.

"The act in question is also unconstitutional because it takes away the right of said city to local self-government in numerous particulars over many matters that do not relate to the police and which the state has always admitted by its legislation to be within the power of the said city exclusively, subjecting the citizens thereof to petty inquisitorial details of regulation and control beneath the dignity of the state and entirely local in nature and character. Even in states where the courts have upheld the power of the state to appoint police officers in municipalities, not one has upheld legislation such as is here proposed.

"The act is also unconstitutional because it limits membership in said board to appointment from the two principal political parties, thereby prescribing a test for political office and excluding all not within the test, which is incompatible with the principles of freedom upon which this state was founded and ever has been governed.

"The act is also unconstitutional because, against the protest of the constituted authorities of the city of Providence, it appropriates the money and property thereof acquired by it in the exercise of its power to tax its inhabitants and their property, for purposes over which the state has no right of control.

"The act is also unconstitutional because it confers legislative powers over the city of Providence upon a board of police and license commissioners which is not elected by the voters of said city, and which in no sense constitutes a legislative body. The General Assembly can delegate its legislative powers only to representatives of the people, and not in the manner provided in said act."

SPECIFICATIONS FOR FLOOR WORK.

The specifications adopted by the Chicago Board of Education for floor work in more than forty public schools read as follows:

Carefully prepare a foundation of cinders, six inches thick, and a cement concrete of best Portland cement, sharp sand and fine broken stone, in the proportions of 1, 3 and 6, varying in thickness from three to five inches (according to conditions) for receiving the "Asphalt Mastic" work. Said foundation should be allowed to dry thoroughly for at least ten days prior to applying Mastic Work. Upon this foundation apply the "Mastic," varying from three-quarters to two inches in thickness (according to conditions), in the following manner: To each cake of "Assyrian" Rock Asphalt Mastic (80 pounds) broken up in small pieces, add four pounds Flux. When this is all melted together add about 100 pounds of coarse, sharp grit (broken granite or sand), gradually added in such quantities as will mix easily in kettle, until the mix is in good working order and from 350 degrees Fahrenheit to 400 degrees Fahrenheit, then spread in place with wooden spatula, sprinkle with fine sand, and rub with wooden float until it is cool enough to work out all air or steam bubbles caused by dampness in the foundation. Guide strips of the required thickness of the finished work should be laid down at such distances as the spreader can reach over conveniently.

The floor to be guaranteed for a term of five years from date of completion, under a bond from a reliable surety and bonding company.

POLICE DEPARTMENT STATISTICS.

The following statistical statements, compiled by the League of American Municipalities, show the number of men, with rank or grade, and salaries paid, in police departments of leading cities. The publication of these statistics began in the December, 1897, issue of City Government, was continued in the January, 1898, issue, and is concluded in this number:

SAN FRANCISCO, CAL.

1	chief of police	$4,000 00
6	captains of police, $1,800 each	10,800 00
5	lieutenants of police, $1,600 each	8,400 00
1	property clerk	1,800 00
1	clerk to chief	1,800 00
43	sergeant of police, $1,500 each	64,500 00
15	Detectives, $1,500 each	22,500 00
12	Corporals, $1,404 each	16,848 00
475	Patrolmen	581,400 00
559	Total	$712,048 00

(Note: $2.00 per month from each man's salary is retained by the city and county treasurer for the Police Relief Health Life Insurance and Pension Fund).

Area of city: 42 square miles.
Population: Census 1890, 297,990.
Chief: I. W. Lees.

ST. PAUL, MINN.

1	Chief	$2,412 48
1	Chief of Detectives	1,929 96
1	Secretary	964 92
4	Captains, $1,254.48 each	5,017 92
6	Lieutenants, $1,061.40 each	6,368 40
1	Mounted Lieutenant	1,321 44
9	Sergeants, $868.44 each	7,815 96
1	Mounted Sergeant	1,128 48
4	Detectives, $1,158.00 each.	4,632 00
128	Patrolmen, $840.00 each	107,520 00
8	Mounted Patrolmen, $1,100.00 each	8,800 00
12	Bicycle Patrolmen, $880.00 each	10,560 00
1	Driver Work House Van	964 92
1	License Inspector	1,060 92
1	Matron	600 00
1	Janitor	600 00
1	Electrician	3,200 00
2	Pound Masters, $600.00 each	1,200 00
183	Total	$166,097 40

(Note: Electrician hires his own help).
Days off with pay: 12 days each year.
Area of city: 55 square miles.
Miles of streets: 384.
Population: Estimated 1898, 200,000.
Chief: M. N. Goss.

SYRACUSE, N. Y.

1	Chief	$2,400 00
1	Inspector of Police	1,200 00
6	Detectives, $$1,020 each	6,120 00
1	Captain Night Watch	1,800 00
1	Lieutenant	900 00
1	Sergeant	900 00
1	Office Man	900 00
1	Clerk to Chief	900 00
1	Door Man	900 00
1	Special Depot Detail	900 00
1	Wagoner	900 00
3	Roundsmen, $900 each	2,700 00
64	Patrolmen, $900 each	57,600 00
3	Patrol Drivers, $840 each.	2,520 00
1	Barnman	720 00
3	Signal Plant Clerks, $720 each	2,160 00
1	Superintendent of Gymnasium	480 00
1	Matron	500 00
92	Total	$84,500 00

Days off with pay, 10.
Area of city, 15 1-2 square miles.
Miles of streets, 350.
Population, about 125,000.
Chief, Charles R. Wright.

SPRINGFIELD, MASS.

1	Marshal	$1,800 00
1	Assistant Marshal	1,175 00
1	Captain	1,075 00
1	Lieutenant	1,000 00
1	Inspector	1,000 00
1	Assistant Inspector	950 00
3	Sergeants, $950 each	2,850 00
36	Patrolmen, $900 each	32,400 00
7	Patrolmen, $850 each	5,950 00
2	Patrolmen, $800 each	1,600 00
1	Matron	500 00
1	Janitor	720 00
1	Driver	780 00
1	Driver	600 00
1	Electrician	300 00
59	Total	$52,700 00

Days off with pay: 14 days furlough per year.
Area of city: 38.55 square miles.
Miles of streets: 133.
Population: Census of 1890—44,179. Estimated 1898—60,000.
Acting marshal: Charles M. Wright.

SOMERVILLE, MASS.

1	Chief	$1,900 00
1	Captain	1,500 00
4	Sergeants, $1,200 each	4,800 00
34	Patrolmen, $1,095 each	37,230 00
2	Patrolmen, $1,003.75 each	2,007 50
8	Reserve Patrolmen, $912.50 each	7,300 00
1	Matron	200 00
1	Keeper of Lockup	100 00
52	Total	$55,037 50

Days off with pay: 14 each year.
Area of city: 4.22 square miles.
Miles of streets: 86.6.
Population: Census of 1895, 52,200. Estimated 1898, 58,000.
Chief: Melville C. Parkhurst.

(CONTINUED ON PAGE 159.)

"Contracting and Purchasing Directory."

PLEASE MENTION CITY GOVERNMENT IN WRITING.

ALARM SYSTEMS, FIRE AND POLICE.

Gamewell Fire Alarm Telegraph Co., 19 Barclay St., New York.

ASPHALT.

Alcatraz Co., San Francisco and New York.
Assyrian Asphalt Co., Chicago.
Columbia Construction Co., Syracuse, N. Y.
Compagnie Generale Des Asphaltes de France, 32 Broadway, New York.

BONDS.

Rudolph Kleybolte & Co., New York.

BAG CARRIERS.

F. C. Austin Mfg. Co., Harvey, Ill.
Thornton N. Motley Co., 43 John St., New York.

BOILERS.

The Murray Iron Works Co., Burlington, Iowa.

BOILER COMPOUND.

Boogher Boiler Compound Co., 220 Broadway, New York.

BRIDGES.

The La Fayette Bridge Co., 800 Perin Building, Cleveland, O.

CEMENT.

Atlas Cement Co., 143 Liberty St., New York.
Assyrian Asphalt Co., Chicago.
Buckeye Portland Cement Co., Bellefontaine, Ohio.

CHEMICAL ENGINES.

Fire Extinguisher Mfg. Co., 325 S. Desplaines St., Chicago, Ill.

CIVIL AND CONSULTING ENGINEERS

J. T. Fanning, 330 Hennepin Ave., Minneapolis, Minn.
Alexander Potter, 137 Broadway, New York.
Wise & Watson, Passaic, N. J.
Charles Carroll Brown, C. E., Bloomington, Ill.
Alton D. Adams, C. E., 40 State street, Boston.
Edward D. Bolton (Landscape), 224 West Seventy-ninth street, New York.

CONTRACTORS.

Assyrian Asphalt Co., Chicago.
J. H. Esson, Chicago.

COUPLINGS, HOSE.

The W. J. Clark Co., Salem, Ohio.

DAMP COURSE.

Assyrian Asphalt Co., Chicago.

ENGINES.

The Murray Iron Works Co., Burlington, Iowa.

ELECTRICAL APPARATUS.

The Siemens & Halske Electric Co., Chicago.

FILLER, ASPHALT.

Assyrian Asphalt Co., Chicago.

FIRE APPARATUS.

E. Howard Browne, 105 Reade St., New York.
Fire Extinguisher Mfg. Co., 325 S. Desplaines St., Chicago, Ill.
Seagrave & Co., Columbus, Ohio.

FIRE EXTINGUISHERS.

Fire Extinguisher Mfg. Co., Chicago.

FIRE FELT COVERING.

H. W. Johns Mfg. Co., 100 William St., New York.

FIRE HOSE.

E. Howard Browne, 105 Reade St., New York.
Fabric Fire Hose Co., 68 Murray St., New York.
Gutta Percha & Rubber Mfg. Co., 35 Warren St., New York.
Mineralized Rubber Co., 18 Cliff St., New York.
Manhattan Rubber Mfg. Co., 18 Vesey St., New York.
New Jersey Car Spring & Rubber Co., Jersey City, N. J.
New York Belting & Packing Co., 25 Park Place, New York.
Peerless Rubber Mfg. Co., 16 Warren St., New York.
Tate & Co., Chicago.

FIREMEN'S HATS.

John Olson, 183 Grand St., New York.
A. Wilson, 135 Bowery, New York.

FLOORS, ASPHALT.

Assyrian Asphalt Co., Chicago.

FLUSH TANKS.

Pacific Flush Tank Co., Chicago, Ill.

FOUNTAINS, PARK AND LAWN.

J. L. Mott Iron Works, 84-90 Beekman St., New York.

GULLY CLEANERS.

Henry W. Atwater, 72 Imperial Bldg., Montreal, Canada.

GARBAGE FURNACES.

Henry W. Atwater, 72 Imperial Bldg., Montreal, Canada.
Dixon Garbage Crematory Co., Toledo, O.

HORSE COLLARS AND HARNESS TRIPS.

John A. Weider, Rochester.

INSPECTORS.

W. R. Conard, Burlington, N. J.

INSULATED WIRES AND CABLES.

Montauk Multiphase Cable Co., 100 Broadway, New York.
Okonite Co., 253 Broadway, New York.

IRON WORK.

J. L. Mott Iron Works, 84-90 Beekman St., New York.

MAIL CHUTES.

Cutler Mfg. Co., Rochester, N. Y.

MASTIC.

Assyrian Asphalt Co., Chicago.

METER TESTING APPARATUS.

Pittsburg Meter Co., East Pittsburg, Pa.

NOZZLES.

Henry W. Atwater, 72 Imperial Bldg., Montreal, Canada.
Fire Extinguisher Mfg. Co., 325 S. Desplaines St., Chicago, Ill.
New Jersey Car Spring and Rubber Co., Jersey City, N. J.

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Jos. Dixon Crucible Co., Jersey City, N. J.

PAINTS, ASPHALT.

Assyrian Asphalt Co., Chicago.

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H. Stevens' Sons Co., Macon, Ga.

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American Car Sprinkler Co., Worcester, Mass.
The Miller Knoblock Co., South Bend., Ind.

STEAM FIRE ENGINES.

American Fire Engine Co., Seneca Falls, N. Y., and Cincinnati, O.
La France Fire Engine Co., Elmira, N. Y.
Manchester Locomotive Works, 40 Water St., Boston, Mass.

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Austin & Western Co., Ltd., Chicago, Ill.
Thornton N. Motley Co., 43 John St., New York.
Henry B. Walker, 208 S. Wayne Ave., Dayton, Ohio.

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Austin & Western Co., Chicago, Ill.
O. S. Kelly Co., Springfield, O.
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STREET SWEEPERS.

F. C. Austin Mfg. Co., Harvey, Ill.
Austin & Western Co., Chicago, Ill.
Charlton Mfg. Co., New York.
H. B. Walker, Dayton, O.

STREET LAMPS.

Thos. T. W. Miner, 821 Eagle Ave., New York.
Pennsylvania Globe Gas Light Co., 248 North Broad St., Philadelphia, Pa.
Welsbach Street Lighting Co., 246 N. Broad St., Philadelphia, Pa.

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VOTING MACHINES.

U. S. Voting Machine Co., Jamestown, N. Y.

WATER FILTERS.

Continental Filter Co., 44 Wall St., New York.
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Buffalo Meter Co., 363 Washington St., Buffalo, N. Y.
Pittsburg Meter Co., East Pittsburg, Pa.
Thomson Meter Co., Brooklyn, N. Y.

NEW SYSTEM OF FIRE ESCAPES.

The current year has thus far been marked by an unusually heavy loss of life by fires in hotels, business buildings, apartment houses and private residences. In New York city alone nearly one hundred lives have been sacrificed to the fury of flames since the beginning of the year—a loss so appalling that it has awakened the people to a realization of the almost criminal neglect they have displayed in failing to provide adequate and efficient means for the saving of human life in cases of conflagation. New York is the fortunate possessor of probably the most complete and capable fire department in the world, yet the prompt and perfectly directed service of this force is sometimes unable to rescue unfortunate people from rapidly rising conflagrations.

At the terrible Windsor Hotel fire the service of the fire department was all that could be within the power of human effort; still scores of lives were lost. And why? Because the hotel was not equipped with a thorough fire alarm system and convenient, reliable fire escapes ready for immediate use by those who were surrounded by flame and smoke before firemen could possibly reach them. The Windsor Hotel fire has furnished an object lesson to the entire country.

Municipal authorities have an unusual interest in this lesson, for it is to them that the occupants and tenants of most buildings must look for protection from the ravages of fire. Their duties do not end when they have provided fire departements for their respective communities; they must continue their work vigilantly. Every possible means of protecting and saving life and property should be provided.

That all buildings occupied day or night by any number of people should be provided with fire escapes is conceded on all sides, and most cities have in their municipal codes laws requiring owners to thus equip their structures. In the enforcement of these laws and ordinances it is the duty of the municipal authorities to aid owners and builders in securing fire escapes that are durable, reliable, safe and ready for instant use. Many of the fire escapes now in general use do not possess any of these qualities.

The most familiar escape at this time is the iron stairway on the exterior of the building. This kind of an escape is by no means safe and reliable; in winter it is frequently so covered with snow and ice that instant use of it would be extremely hazardous; at all times it is a convenience for prowlers and thieves; in many cases it becomes a storage receptacle; it is never an architectural ornament, and at its best it does not afford a ready exit from every room.

Mr. C. R. Harris, of Williamsport, Pa., has invented a fire escape which meets all of the objections specified against the exterior iron stairway. He has also invented an alarm system the use of which in conjunction with his fire escapes affords the most perfect protection conceivable. Municipal authorities will find in this recently invented apparatus something of especial interest to them in their work of promoting the fire service.

The principle of Mr. Harris's fire escape is a steel ladder made of three flexible steel wire cables, with rungs of hollow steel securely fastened thereto, constructed so as to be free from rust and decay, and which ladder rolls up on a reel like a rope, occupying very little space, and is always ready for use, making every apartment entirely independent of stairs and elevators. The ladder is not complicated, is strong and so constructed that it will easily unroll.

The rungs of the ladder, supported by the three cables, are practically unbrakable. The cables are made of specially flexible hard drawn steel wire.

The Harris portable fire escape is attached securely to the lower inside casing of any window desired, and is enclosed in a handsome oxidized metal case, and provides immediate means, when necessary, of getting out of a building, as well as for getting in. The latter is of great importance since it provides a ladder for the firemen to at once enter a building and locate the fire, and with chemical appliances or hose extinguish it before the hook and ladder truck arrives, without necessitating the use of scaling ladders or otherwise consuming most valuable time. Every ladder is thoroughly tested and is plenty strong enough to hold the weight of several men and a line of hose.

Aside from the portable escape, but on the same principle, Mr. Harris has invented an automatic system of fire escapes for hotels, apartment houses, schools, factories, office buildings, large private residences, etc. The automatic escape is like the portable, except that it is placed under a cornice or on a gable of a building and connected with a perpendicular cable, running through the interior of the building, by which it is automatically released when needed. Mr. Harris describes the operation of the automatic system as follows:

"Connected with the metallic case which contains the steel fire escape or ladder is a wire cable running perpendicularly through the building, inside. This cable plays the initial part in the releasing of the fire escape from the case. In its downward course through the various floors it is provided with fusible links. When one of these is heated to the danger point and melts, or by pulling the cable, the case suddenly opens, the steel ladder issues forth and unrolls from the reel within easy reach of the windows, until it touches the ground below, where it is secured and made taut by means of a drop ratchet fastened to the side of the building, or a ratchet and hooks. This ratchet acts on the axle of the reel and the ladder being fastened in the metallic case above, tension becomes possible.

"A gong in the case and one attached to the end of the reel ring for several minutes —the time can be increased or diminished— after the escape is released, and can be heard for a distance of two or three blocks. When fire occurs at night, gongs in connection with the escape and those within the building awaken the inmates to their peril. If the ordinary means of exit have been cut off by the flames or smoke, the Harris escape is ready for instant use.

Mayor George E. Green, of Binghamton, N. Y., who is well and favorably known to many readers of "City Government," is treasurer and general manager of the company. * * *

HARRIS PORTABLE FIRE ESCAPE.

HARRIS AUTOMATIC FIRE ESCAPE.

—The municipal water and electric light plants at Wapakoneta, Ohio, are being operated with great success. For the fiscal year just closed the plants made a net earning of 8 per cent., after deducting interest on bonds issued. The cost per arc lamp for street lighting is reported at $28.44.

"To writers and thinkers on municipal problems the volume is almost indispensable."—OUTLOOK.

Municipal Monopolies

By EDWARD W. BEMIS, JOHN R. COMMONS, FRANK PARSONS, M. N. BAKER, F. A. C. PERRINE, MAX WEST. 12 mo, cloth, appendix, index, $2 00. (Vol. XVI., Crowell's Library of Economics and Politics.)

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POLICE DEPARTMENT STATISTICS.

(CONTINUED FROM PAGE 156.)

ST. JOSEPH, MO.

1	Chief	$2,000 00
1	Captain	1,200 00
2	Sergeants, $1,000 each	2,000 00
47	Patrolmen, $840 each	39,480 00
1	Secretary	1,200 00
1	Humane Officer	840 00
1	Janitor	780 00
1	Matron	600 00
2	Drivers, $600 each	1,200 00
57	Total	$49,300 00

(Note: Patrolmen are employed for the first six months on probation at $60 per month and if they prove efficient they are appointed for a term of three years at $70 per month. There are three police commissioners one of whom receives $700 per year and the other two $500 each; they are appointed by the Governor of the State for a term of three years).

Area of city, 10 square miles.

Population: Census of 1890, 52,324. Estimated 1898, 70,000.

Chief, John Broder.

SALEM, MASS.

1	Marshal	$1,500 00
1	Assistant Marshal	1,000 00
1	Captain	1,000 00
1	Sergeant	950 00
31	Patrolmen, $912.50 each	28,287 50
1	Driver	912 50
2	Watchmen, $803 each	1,606 00
38	Total	$35,256 00

Population: Census 1890, 30,801. Estimated 1898, 35,000.

Marshal: John W. Hart.

SEATTLE, WASH.

1	Chief	$1,500 00
2	Captains, $1,080 each	2,160 00
3	Sergeants, $1,020 each	3,060 00
7	Detectives, $900 each	6,300 00
50	Patrolmen, $840 each	42,000 00
2	Clerks, $840 each	1,680 00
2	Jailers, $840 each	1,680 00
2	Drivers, $840 each	1,680 00
1	Matron	360 00
2	Herders, $840 each	1,680 00
2	Dog Catchers, (six months), $240 each	480 00
74	Total	$65,580 00

Days off with pay: 15 each year.

Area of city: 28 square miles.

Miles of streets: About 102 (graded).

Population: Census 1890, 43,835. Estimated 1898, 80,000.

Chief: C. S. Reed.

SAVANNAH, GA.

1	Chief	$2,000 00
1	Lieutenant	1,000 00
6	Sergeants, $1,000 each	6,000 00
3	Detectives, $900 each	2,700 00
1	Clerk	900 00
73	Patrolmen, $780 each	56,940 00
1	Electrician	600 00
2	Patrol Wagon Drivers, $600 each	1,200 00
1	Ambulance Driver	480 00
1	Stable Foreman	660 00
3	Stable Grooms, $360 each.	1,080 00
2	Pensioners, $260 each	520 00
95	Total	$74,380 00

(Note: The chief also commands the force doing duty on the wharves of the Ocean S. S. Co. for which he receives $600 per annum additional compensation. This force is paid by the O. S. S. Co., but is organized under the same rules and regulations as the city force proper, and is composed of one sergeant at $83 per month, two sergeants at $75 per month and 21 patrolmen at $60 per month).

Population: Census of 1890, 43,189.

Chief: Frank McDermott.

TOLEDO, OHIO.

1	Chief	$1,500 00
1	Lieutenant	1,000 00
3	Detectives, $900 each	2,700 00
100	Patrolmen, $800 each	80,000 00
9	Sergeants, $900 each	8,100 00
1	Secretary	1,000 00
2	Janitors, $600 each	1,200 00
3	Turnkeys, $800 each	2,400 00
2	Matrons, $480 each	960 00
1	Police Surgeon	300 00
123	Total	$99,160 00

Area of city: 28.57 square miles.

Miles of streets: 400.

Population: Census of 1890, 81,434. Estimated 1898, 147,790.

Chief: Benjamin Raitz.

TROY, N. Y.

1	Superintendent	$2,200 00
1	Chief Detective	1,500 00
3	Captains, $1,050 each	3,150 00
3	Detectives, $1,050 each	3,150 00
9	Sergeants, $950 each	8,550 00
80	Patrolmen, $850 each	68,000 00
1	Clerk	1,050 00
1	Surgeon	450 00
3	Janitors, $550 each	1,650 00
102	Total	$89,700 00

Population: Census of 1890, 60,000.

Superintendent: W. W. Willard.

UTICA, N. Y.

1	Chief	$1,200 00
1	Assistant Chief	960 00
28	Officers, $720 each	20,160 00
1	Clerk	360 00
1	Matron	360 00
32	Total	$23,040 00

Area of city: 7 square miles.

Miles of streets: 107.

Population: Census 1890, 44,007; estimated 1898, 60,000.

Chief: Charles F. Cleveland.

WORCESTER, MASS.

1	Chief	$2,000 00
1	Deputy Chief	1,500 00
2	Captains, $1,200 each	2,400 00
2	Detectives, $1,186.25 each.	2,372 50
2	Lieutenants, $1,150 each.	2,300 00
5	Sergeants, $1,100 each	5,500 00
102	Patrolmen, $1,003.80 each.	102,387 60
4	Patrolmen, $912.50 each.	3,650 00
7	Patrolmen, $821.25 each.	5,748 75

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800 Perin Bldg., CINCINNATI, O.

1 Secretary.....	900	00
4 Doormen, $912.50 each....	3,650	00
2 Patrol Drivers, $861.60 each.....	1,723	20
1 Matron.....	700	0
1 Janitor.....	600	00
135.... ....Total..	$135,432	05

Days off with pay: 10 each year.
Area of city: 34.02 square miles.
Miles of streets: 246.
Population: Census 1890, 84,655; estimated 1898, 112,000.
Chief: James M. Drennan.

WELMINGTON, DEL.

3 Police Commissioners, $500 each....	$1,500	00
1 Chief.....	1,200	00
2 Captains, $900 each.....	1,800	00
1 Surgeon.....	300	00
10 Sergeants, $840 each.....	8,400	00
70 Patrolmen, $760 each.....	53,200	00
2 Matrons, $500 each.....	1,000	00
1 Superintendent of Police.	600	00
1 Janitor....	600	00
1 Lineman....	780	00
92..... ....Total..	$69,380	00

Population: Census of 1890, 61,431.
Chief: John F. Dolan.

—The ninth annual report of the water commissioners of Gloversville, N. Y., shows that the gross earnings amounted to $32,108.36, the interest charges and operating expenses were $14,778.62, making the profits for the year $17,329.74.

—The Edison Electric Company of South Bend has been incorporated under the laws of the state of Indiana for the purpose of installing an Edison 3-wire low tension current lighting plant at South Bend, Indiana, the capital stock of the company being $100,000. The incorporators are Otto M. Knoblock, Geo. A. Baker, Albert W. Morrell, George Wyman and Samuel S. Perley.

—The new officers of the American Water Works Association are: President, R. M. Clayton, Atlanta, Ga; first vice president, W. R. Hill, Syracuse, N. N.; second vice president, J. B. Heim, Madison, Wis.; third vice president, E. M. Mather, Harrisburg, Pa.; fourth vice president, C. H. Campbell, Charlotte, N. C.; fifth vice president, William Molis, Muscatine, Ia.; secretary and treasurer, P. Milne, New York; finance committee, D. R. Gwynn, Quincy, Ill., W. H. Laing, RRacine, Wis., and A. R. Tucker, Memphis, Tenn.

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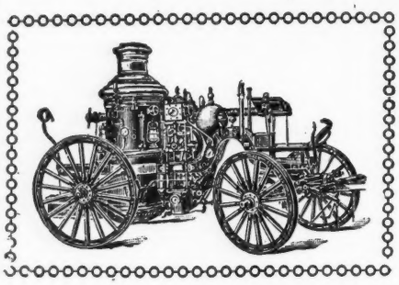

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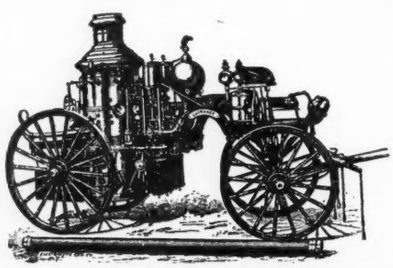

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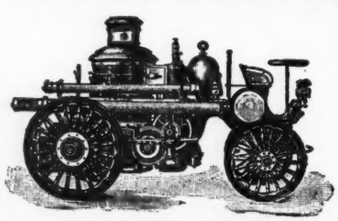

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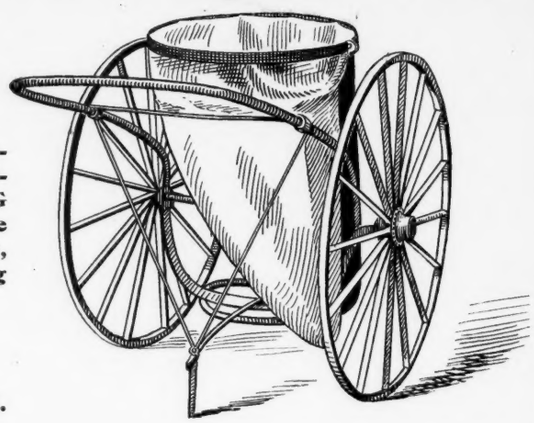

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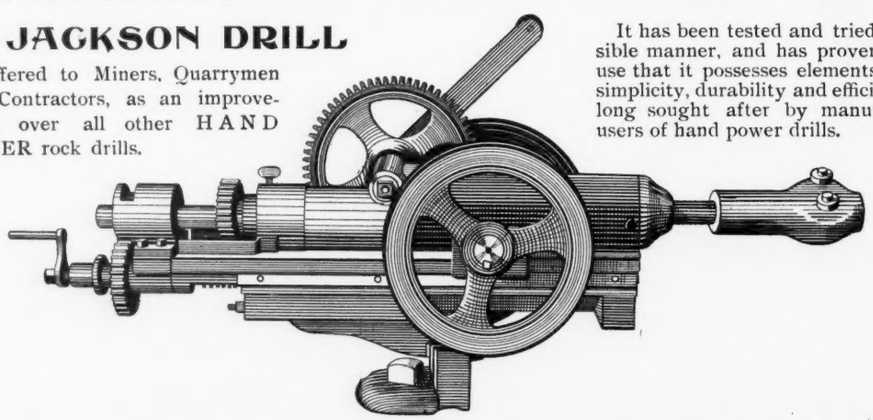

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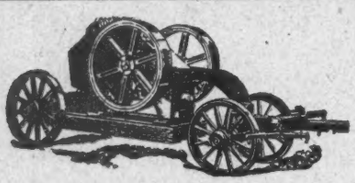

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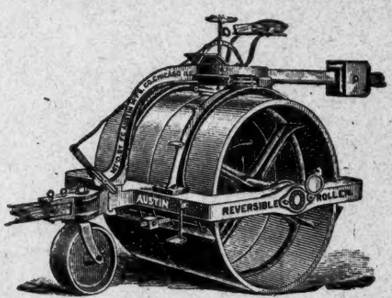

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Garbolized Rubber Fire Hose
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We will be glad to mail our catalogue upon request and give all possible information.

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MILLER SPRINKLERS ARE STANDARD...

And are in use in hundreds of cities in this and foreign countries.

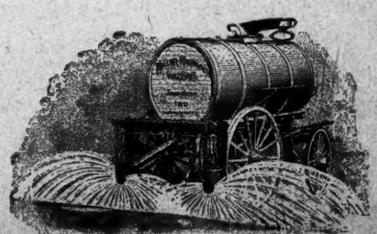
We solicit correspondence regarding Sprinkling. If you contemplate figuring on **SPRINKLERS,** let us know. We carry a full stock for prompt shipment.

Miller Patent Sprinklers are always to be relied on as made of good material and to work well.

WIDE-THROWING CAR SPRINKLER.

The Miller-Knoblock Co.,

SOUTH BEND, INDIANA.



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NEW YORK: 33 Nassau Street PHILADELPHIA: 1932 Market Street CHICAGO: 54 Lake Street

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OWNS, CONTROLS AND
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The NEW IMPROVED and PATENTED

Street Light Burner

For Lighting Streets, Boulevards and Parks.

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SOME POINTS IN OUR FAVOR:

1. Welsbach Street Lighting a recognized and complete success with our PATENTED APPLIANCES.
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4. Serves as police protection in outlying districts.
5. Our Lanterns are ornamental and beautify your streets.

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MANUFACTURERS OF

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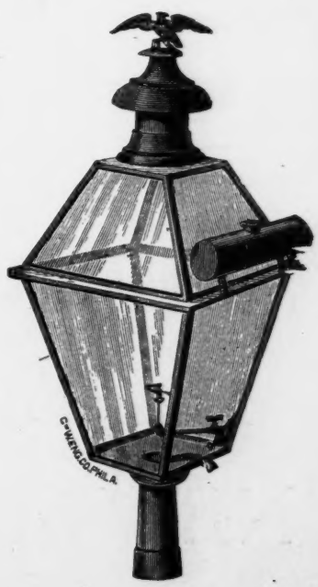

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WHEN CONTEMPLATING A BOND ISSUE
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TO COMMUNICATE WITH
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Third and Walnut Sts. — CINCINNATI.

BIDS FOR ELECTRIC LIGHTING.

ZANESVILLE, OHIO, May 25th, 1899.

Notice is hereby given that sealed proposals will be received at the office of city clerk of said city, until 12 o'clock, noon,

Saturday, June 24, 1899,

For the furnishing of electric lights for lighting the streets, alleys, public grounds, public buildings and bridges of said city. Said bids shall specify the price per light for all night, every night lighting and also for moonlight schedule lighting, for a term of 1, 2, 3, 4 and 5 years.

The city reserves the right to accept bid for either period of time mentioned and also reserves the right to reject any or all bids.

By order of city council.

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City Clerk.

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EXAMINATION
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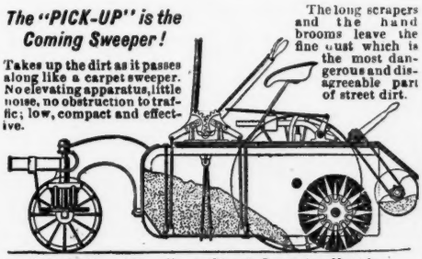
Takes up the dirt as it passes along like a carpet sweeper. No elevating apparatus, little noise, no obstruction to traffic; low, compact and effective.

The long scrapers and the hand brooms leave the fine dust which is the most dangerous and disagreeable part of street dirt.



International Two-Horse Street-Sweeping Machine,
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And of every description.

Samples and prices on application.

Correspondence solicited.

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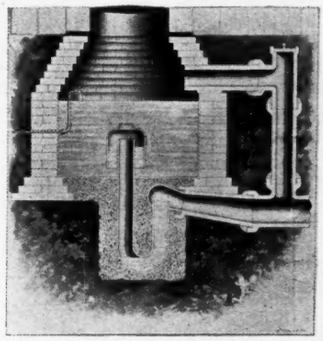

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For FLUSHING STREET SEWERS and for SUB-SOIL IRRIGATION.

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This Asphalt is mined on the Island of Trinidad, from the celebrated Deposits of the Countess Dundonald, and is, in all respects, the equal of the so-called Trinidad Lake Asphalt. . . . . .

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For PAVING, ROOFING, ELECTRICAL INSULATING and other purposes.

WARRANTED EQUAL TO ANY ASPHALT IN USE FOR LAYING PAVEMENTS.

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20,062 WATER METERS

SOLD AND DELIVERED BY THIS COMPANY IN THE YEAR 1898.

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WE STAMP OUR METERS ONLY AS WE SELL THEM.

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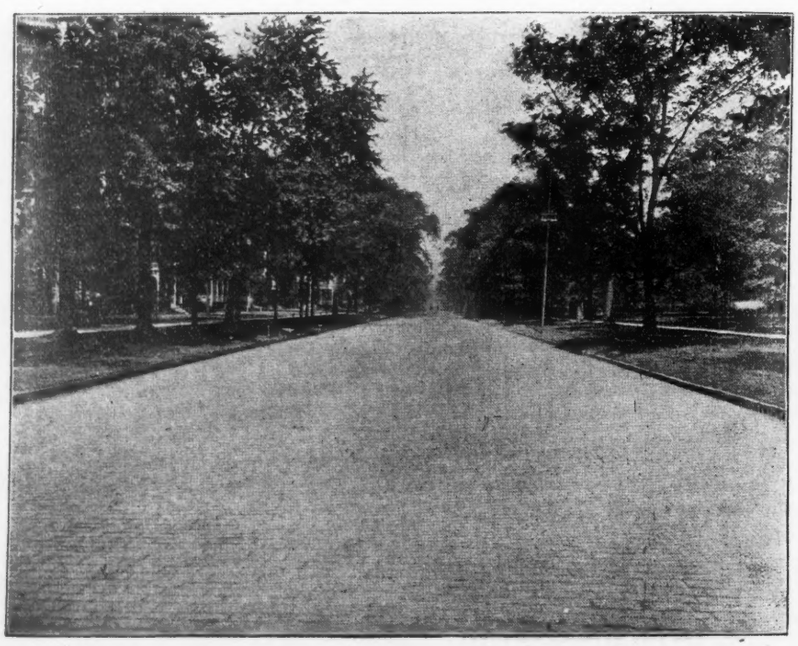
QUARRIES AT ALBION, NEW YORK.



Medina Dressed Block Stone Pavement, Euclid Ave., Cleveland, O.

WE CLAIM FOR OUR MEDINA STONE PAVEMENT:

1st. **IT IS NOT AN EXPERIMENT.** Its use in hundreds of miles of pavements during fifty-seven years since it was first used has demonstrated the wearing qualities of Medina Stone to be equal to those of granite. We have paved streets in twenty of our larger cities with this material.

2d. **IT IS NEVER SLIPPERY,** whether wet or dry; it **NEVER POLISHES,** and horses never fall or slip on this pavement.

3d. **IT IS NOT SO NOISY AS GRANITE,** nor is it more noisy than an asphalt pavement. The tread of a horse makes more noise on asphalt, while the roll of a carriage makes more noise on the stone.

4th. Laid in the form of our dressed block, the interstices filled with hot cement, it is cleaned easily, and, from a sanitary point of view, it has no superior.

5th. From no rock yet found can so smooth a pavement be made as from **MEDINA STONE.**

6th. It can be laid for less price than any stone equally as smooth and durable.

7th. It is the most economical. This material has been in use more than fifty years, and with this as a basis of fact and not of "guess work," we can safely say it is far more economical than pavement of cheap and not durable material, or of artificial mixtures whose first cost is about the same, but which entail upon the tax-payer the **NEVER-ENDING COST** of repairs. Put down a pavement that will **BEAR NEGLECT** and be happy.

8th. Finally, we claim economy, comfort and health to the fullest degree.

Among the many miles of this pavement laid by us we refer to a few prominent streets as follows:

Cleveland, Ohio—Superior St., viaduct, ½ mile, 1878; Ontario St., ¼ mile, 1881; Superior St., ¼ mile, 1881; Prospect St., 1 mile, 1882; Euclid Ave., 5 miles, 1882 3-4; Wilson Ave., Euclid to Wilson, 1½ miles, 1885; Perry St., ¾ mile, 1888; Cedar Ave., 1½ miles, 1889; Woodland Ave., 1 mile, 1891; Cedar Ave., ½ mile, 1895; Hough Ave., mile, 1895.

Columbus, Ohio.—High St., 1886; Long St., 1888 Front St., 1888; Third St., 1888; Spring St., 1888.

Springfield, Ohio.—Main St., 1889; Fountain St., 1889; Limestone St., 1889; High St., 1889.

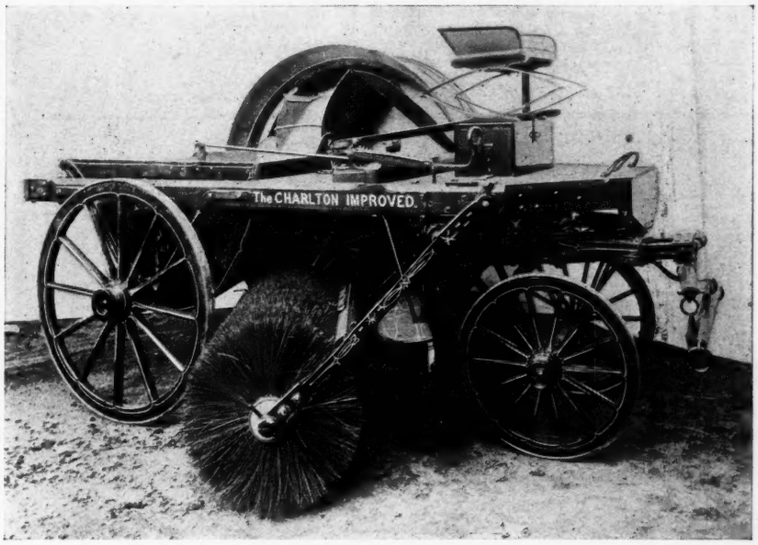
Rochester, N. Y.—Main St., 1892.

Buffalo, N. Y.—Seneca St., 1892.

Toledo, Ohio.—Summit St., 1885; St. Clair St., 1889; Monroe St., 1889; Adams St., 1890; Cherry St., 1889; Bridge St., 1891.

An examination of our work and investigation of its merits as an economical, healthful and comfortable proposition is solicited.

"IT TAKES THE DIRT WITH IT."



Weight, 2,300 pounds. Length of Broom, 8 feet. Diameter of Wheel, 5 ft. 10 in. Capacity of sweeping 50,000 sq. yards in 10 hours.

This NEW and IMPROVED DEVICE for street cleaning commends itself to all who are interested in the CLEANLINESS OF STREETS, whether officially or otherwise. This Sweeper is SIMPLER IN CONSTRUCTION, MORE DURABLE, LIGHTER OF DRAUGHT and MORE ECONOMICAL in its work than any other "Pick-up" machine ever introduced. **Its Efficiency is Fully Guaranteed.**

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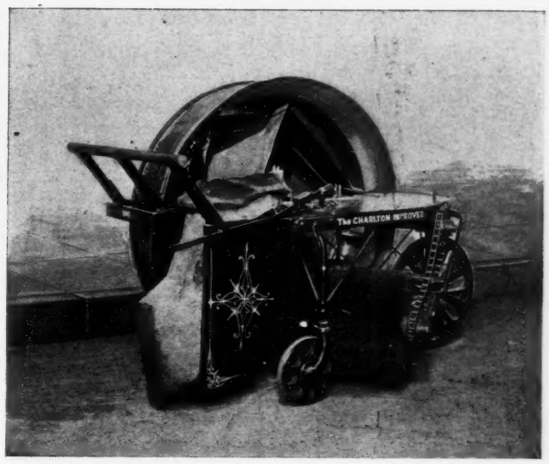
THE CHARLTON STREET SWEEPER

Specially adapted to Asphalt, Brick and Block Pavement.

It Does its Work to Perfection.

THE CHARLTON HAND SWEEPER.

A LITTLE WONDER.



Weight, 215 pounds. Length of Broom, 2 ft. 3 in. Diameter of Wheel, 3 ft. 6 in. Length of Frame, 4 ft. Width of Frame, 27 in.

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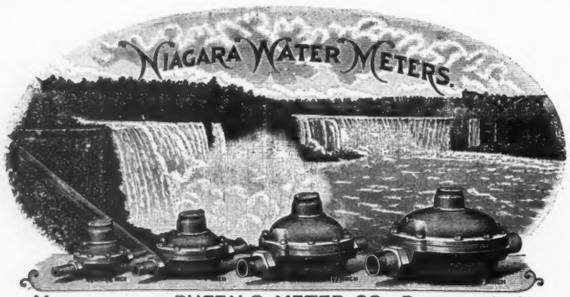

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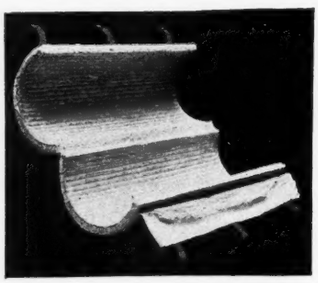

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Supplied ready for use.
For Warehouses, Breweries, School Floors, Driveways, Sidewalks, Etc.
Unaffected by liquids of any kind.
Does not disintegrate.

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For Stone, Wooden or Brick Pavement.
Does not crack or run nor disintegrate.
Unaffected by liquids.
Supplied at from 8 cts. per gallon up.

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For Roofs, Iron Work, Bridges, Etc.
Acid proof, Anti-Rust, Etc.

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For Water Pipes, Conduits, Etc.
Unaffected by Electrolysis, Earth Salts, Etc. Perfect Insulator.

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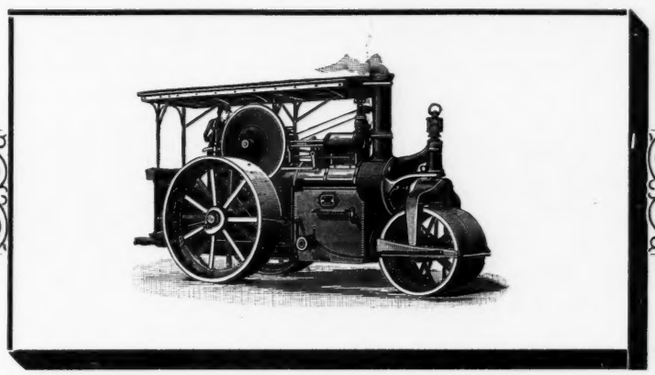

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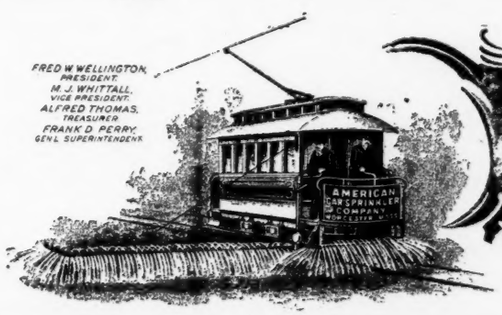
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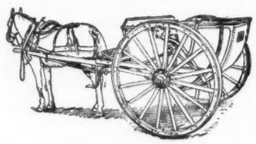

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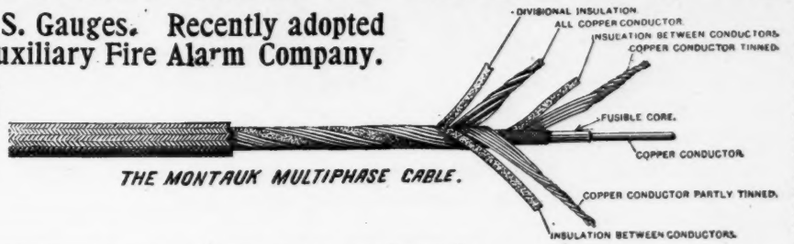
" 546,262	" 565,410
" 565,153	" 594,034
" 565,178	" 594,247
" 565,188	" 594,281



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The garbage itself furnishes the fuel, and creates steam power to the extent of from two to three horse-power per ton of garbage which can be utilized for operating electric light plant or any other municipal industry.

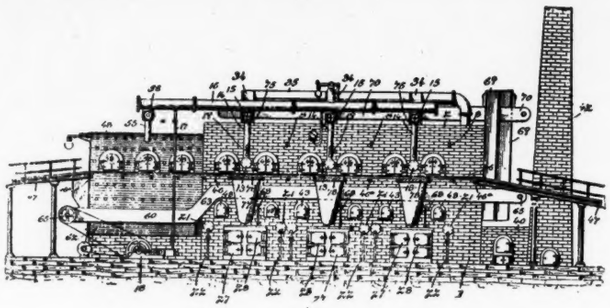

FIG. 1—SIDE VIEW EXTERNAL.

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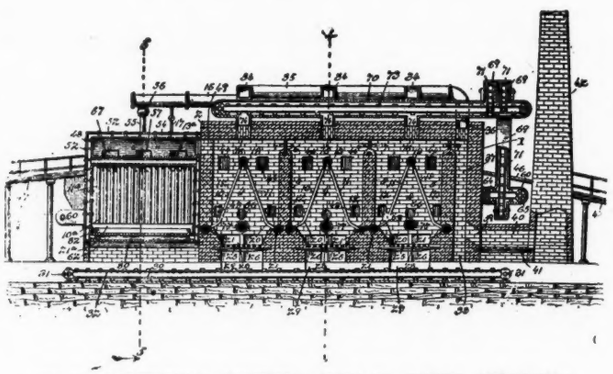

FIG. 2—LONGITUDINAL SECTIONAL VIEW OF ENTIRE CREMATORY.

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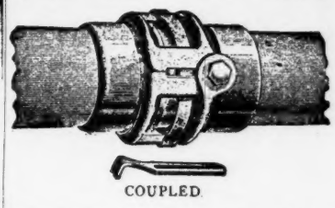

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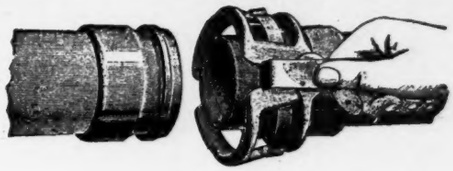

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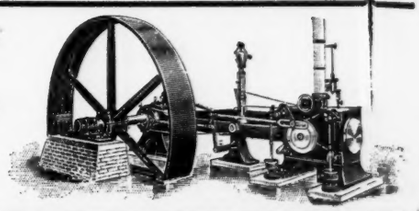

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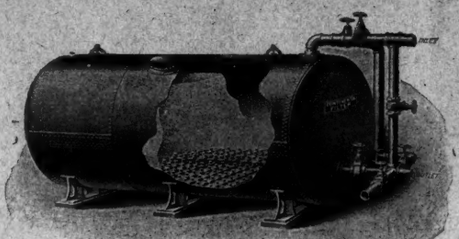

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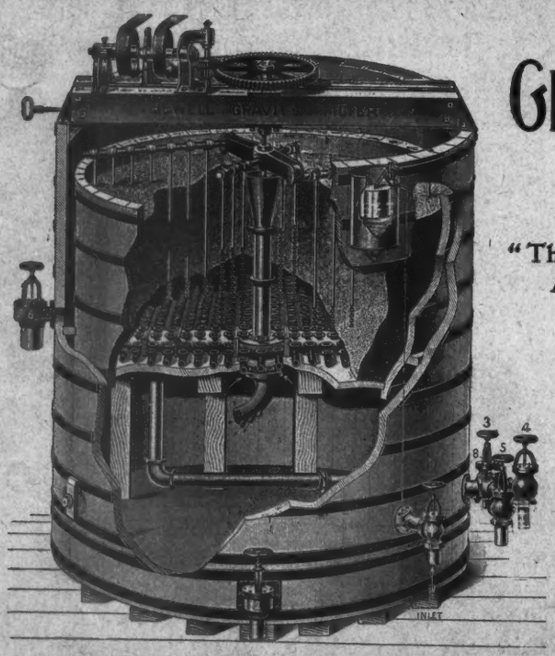

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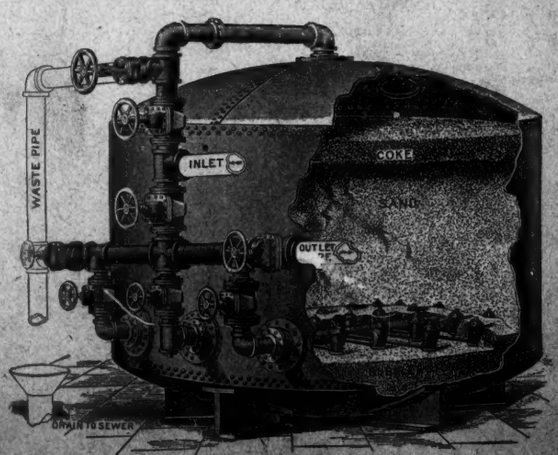

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